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ORIGINAL PAPER

Newly Acquired Burnout During the Coronavirus Disease 2019 (COVID-19) Pandemic: A Retrospective Cohort Study on the Experiences of New York State Primary Care Clinicians

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Abstract

The well-being of primary care clinicians represents an area of increasing interest amid concerns that the COVID-19 pandemic may have exacerbated already high prevalence rates of clinician burnout. This retrospective cohort study was designed to identify demographic, clinical, and work-specific factors that may have contributed to newly acquired burnout after the onset of the COVID-19 pandemic. An anonymous web-based questionnaire distributed in August 2020 to New York State (NYS) primary care clinicians, via email outreach and newsletters, produced 1,499 NYS primary care clinician survey respondents. Burnout assessment was measured pre-pandemic and early in the pandemic using a validated single-item question with a 5-point scale ranging from (1) enjoy work to (5) completely burned out. Demographic and work factors were assessed via the self-reporting questionnaire. Thirty percent of 1,499 survey respondents reported newly acquired burnout during the early pandemic period. This was more often reported by clinicians who were women, were younger than 56 years old, had adult dependents, practiced in New York City, had dual roles (patient care and administration), and were employees. Lack of control in the workplace prior to the pandemic was predictive of burnout early in the pandemic, while work control changes experienced following the pandemic were associated with newly acquired burnout. Low response rate and potential recall bias represent limitations. These findings demonstrate that reporting of burnout increased among primary care clinicians during the pandemic, partially due to varied and numerous work environment and systemic factors.

Keywords Burnout · COVID-19 pandemic · Primary care clinician

Introduction

Clinician burnout poses an existential threat to health care capacity in the United States [1–4]. In addition to the wave of baby-boomers leaving the workforce for planned retirement, burnout due to the coronavirus disease 2019 (COVID-19) pandemic has led clinicians to retire early or change occupations, further decreasing capacity [2, 5, 6]. Primary care clinicians in the United States (i.e., physicians (MDs/DOs), nurse practitioners (NPs), and physician assistants (PAs)) had already been reporting high burnout rates prior to the pandemic [7–15]. A 2019 national study estimated that, by 2034, the shortfall of primary care physicians nationally would be between 17,800 to 48,000 [5]. The full impact of the pandemic on the primary care workforce is currently unclear; however, researchers anticipate large, meaningful reductions in revenue for primary care practices due to COVID-19, which may result in financial hardships that threaten practice viability [16].

During the pandemic, substantial research has been conducted on burnout among clinicians in hospital-based settings, medical specialties, and training programs [2–4, 17–19]. Less research has been conducted assessing burnout among primary care clinicians and independent practitioners based in the community. The few studies published found the pandemic created substantial increases in job demands with varying levels of support resources and control over work-related issues [20–23]. When compounded with the increased risk for COVID-19 related death and the possibility of job loss, reassignments, furloughs, and reduced hours;

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stress has greatly increased among primary care clinicians [20–23].

Almost all research on burnout, both before and during the pandemic, measured prevalence of burnout. Given the high burnout levels reported among primary care clinicians before COVID-19 [7–15] understanding the effect of this pandemic can be critical in implementing workforce well-being and retention programs. The knowledge base regarding interventions would benefit from identifying pre-pandemic risk factors that contributed to the onset of newly acquired burnout during this crisis.

This study provided an opportunity to understand primary care clinician characteristics and work-specific issues related to newly acquired burnout early in the pandemic. First, we explored the demographic characteristics of clinicians that are potential risk factors for newly acquired burnout. Second, we explored whether clinical and practice characteristics of clinicians provide valuable information about newly acquired burnout risk once adjusted for demographic factors. Third, in the absence of burnout prior to the COVID-19 pandemic, we investigated work control issues related to risk of newly acquired burnout during the early pandemic period. Finally, following the onset of the pandemic, we reviewed changes in work control issues related to newly acquired burnout during the early COVID-19 pandemic period.

Methods

Study Design

The main research questions were addressed using a retrospective cohort study design. A voluntary, anonymous, web-based questionnaire for primary care clinicians (MDs, DOs, NPs, and PAs) in New York State (NYS) solicited information on demographic characteristics, descriptions of clinical practice, clinicians' perceived control of the work environment, competing demands external to clinical practice, and burnout both prior to the pandemic and during the early pandemic period. All data were collected in August 2020.

Participants

Three data sources were used to identify primary care clinicians practicing in NYS: NYS Department of Health (DOH) Provider Network Data System (PNDS) (n = 50,481, n = 44,954 with email addresses); New York Chapter of American College of Physicians (NYACP) members (n = 7,055); and the New York State Academy of Family Physicians (NYSAFP) members (n ~ 6000). PNDS includes information on health care clinicians participating with public or private health insurance in NYS, excluding clinicians working exclusively with federal medical facilities, Medicare, or FFS Medicaid. The target population includes providers designated as primary care providers by plans, including those providing primary care exclusively or in addition to specialty level care. NYACP is NYS's largest medical specialty organization representing primary care medicine physicians, while NYSAFP is a medical society of physicians and medical students devoted solely to primary care. Clinicians identified from PNDS and NYACP were emailed an invitation to participate in the study with a link to the questionnaire. Clinicians identified via PNDS were sent weekly reminders for three subsequent weeks. NYACP and NYSAFP also included a link to the questionnaire in member e-newsletters.

Questionnaire

Burnout

Burnout was ascertained using a single item from the Mini Z instrument [24–26]. The single item was validated externally against the Maslach Burnout Inventory and demonstrated good correlation (r = 0.64) [27, 28]. Respondents were asked to select from the following options representing their level of stress: (1) "I enjoy my work. I have no symptoms of burnout." (2) "I am under stress. I don't have as much energy as I need, but I don't feel burned out." (3) "I am definitely burning out and I have one or more symptoms of burnout, such as physical and emotional exhaustion." (4) "The symptoms of burnout that I am experiencing won't go away. I think about work frustrations a lot." and (5) "I feel completely burned out. I am at a point where I may need to seek help." This measure is often dichotomized as no symptoms of burnout (selection 1 or 2) vs. one or more symptoms (selection 3 to 5) [25]. Burnout assessment was time-dependent and assessed separately for prior to the pandemic and early in the pandemic. For this study, we focused on clinicians with newly acquired burnout, meaning clinicians who responded with selection 1 or 2 for the pre-pandemic period and 3, 4, or 5 for the early pandemic period.

Demographics and Time Demands Outside Work

The questionnaire included standard demographic variables: age, gender, race and ethnicity, and marital status. We also collected data on ages of dependents as pandemic safety protocols disrupted day care, schooling, disability services, elder care, and other programs utilized by clinicians and their families.

Time-dependent (prior to pandemic, early in pandemic) items related to perceived life demands were also ascertained. Clinicians were asked to respond to: "I experience a lack of enough time or energy for work due to responsibilities outside of work, including the needs of my family."

with a 5-option scale ranging from "not at all" to "all the time". This question was developed from stakeholders' input regarding potential issues that clinicians face.

Clinical Characteristics

Clinical characteristics included type of license (e.g., physician vs. NP), primary care specialty (e.g., internal medicine, family practice, general medicine and/or pediatrics), and administrative duties. Clinical setting was ascertained by three factors: facility type (e.g., employed by a physician-owned medical group, federally qualified health center (FQHC)), ownership status (i.e., owner, co-owner, employee), and practice size (i.e., number of clinicians). Because these factors are strongly related, the information was combined into a variable based on bivariable associations with burnout (i.e., FQHC employees, non-FQHC practice employees, practice owners/co-owners (not solo practices), clinicians in solo practice, and unknown). Practice location (i.e., county) also was collected.

Work Environment Factors and External Demands

Based on a literature review, a series of work-related factors associated with burnout were included in the questionnaire [29–35]. Clinicians were asked whether they perceived a lack of control over (1) patient load, (2) time allotted to see patients, (3) work schedule, (4) medical decisions for patients, (5) patients' length of stay, (6) insurance coverage of services ordered for patients, (7) how they are evaluated via standardized quality metrics, and (8) compensation. As with the burnout question, respondents were asked these questions twice covering the pre-pandemic period and the early pandemic period. A summary score, lack of work control count, was computed as the number of issues endorsed (range 0–8), for each time-period. The difference between the pre-pandemic and early pandemic summary scores was also computed for analyses.

Statistical Analysis

Retrospective Cohort Study

All analyses were conducted using SAS version 9.5 (SAS Institute Inc, Cary, NC, USA). Associations between predictor variables with newly acquired burnout were computed with proportions, unadjusted relative risks (RR), and adjusted RRs. All RRs were estimated using Poisson regression with robust variance estimates to avoid convergence issues [36]. Throughout, 95% confidence intervals were calculated and associations with p-values of 0.05 or less were considered significant.

Models were built to answer the questions posed. Model 1a included only demographic characteristics; Model 1b added clinical characteristics. All demographic and clinical variables collected were utilized to adjust further models. Models 2a and 2b were designed to identify pre-pandemic predictors of newly acquired burnout. Model 2a included the pre-pandemic lack of control summary score and 2b replaced the summary score with the eight lack of control issues. Backward stepwise selection method was used to identify key lack of control issues. Models 3a and 3b investigated changes in perceived control at work from the pre-pandemic period to early in the pandemic period, adjusted for pre-pandemic predictive factors. Model 3a investigated how the change in the lack of control summary score (i.e., no change, increasing/worsening score, decreasing/improving score) was associated with newly acquired burnout. Model 3b assessed changes in the individual control issues.

All models were evaluated for data fit, with particular attention paid to leverage that could result in errors estimating parameters. Missing data in covariates was addressed by creating a separate category for missing and maintaining the data in models. Effect modification was assessed by stratifying key factors and comparing parameter estimates that helped determine variable combinations and give explanation to associations with newly acquired burnout (e.g., gender, marital status).

Results

A total of 50,481 physicians, NPs, and PAs were identified for outreach based on the PNDS; valid email addresses were available for 44,954 (89.1%). Self-identifying non-primary care specialists and subspecialists (n = 614) likely responded to links in newsletters and were excluded. Thus, the response proportion was 8.1% (3,627/44,954) among targeted primary care clinicians. Exclusions from the analyses also occurred for clinicians not providing specialty information (n = 1,517), PA respondents (n = 4), and non-patient care clinicians (n = 17) (Fig. 1). After exclusions, 2,089 clinicians were identified, including 1,499 who reported no burnout during the pre-pandemic period. We focused on the 1,499 clinicians who reported no burnout in the pre-pandemic period in order to evaluate newly acquired burnout. Thirty percent (454/1,499) of these clinicians reported burnout during the early pandemic period.

Demographic and Clinical Characteristics for Newly Acquired Burnout

Newly acquired burnout was reported more often by clinicians who were women and those younger than 56 years old and was reported less by self-identified Asian clinicians.

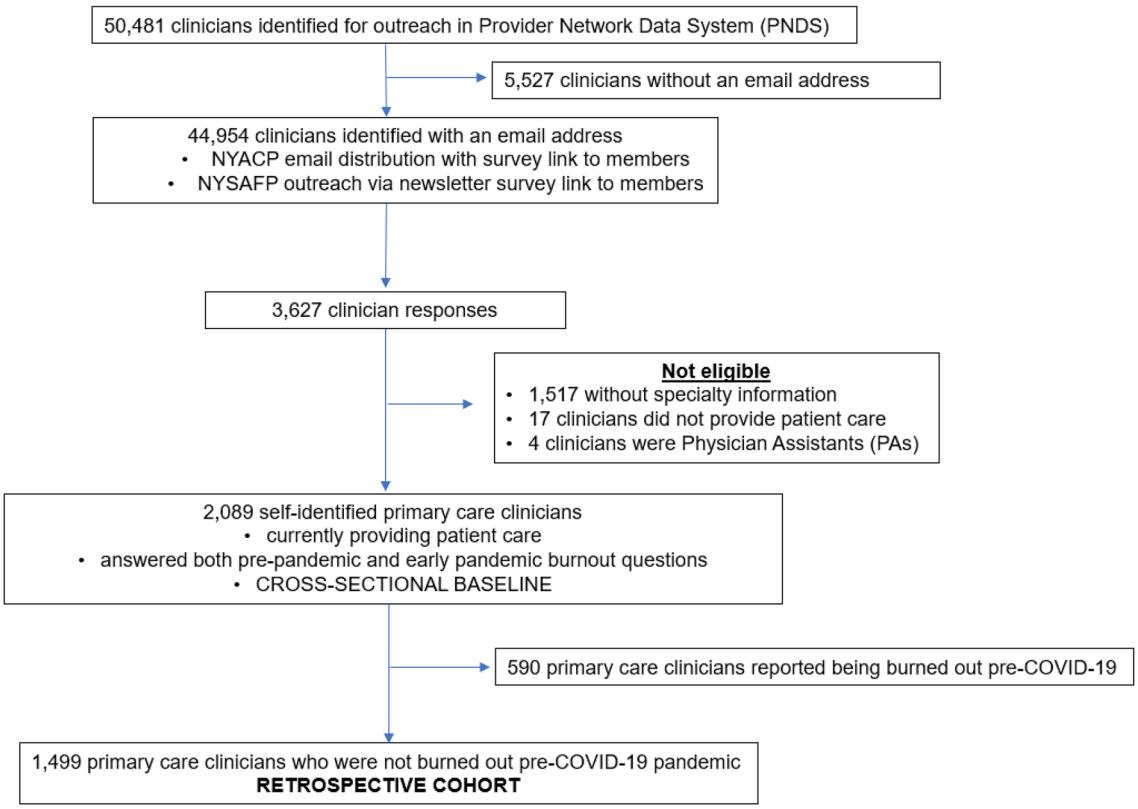

Fig. 1 Participant flow chart

Clinicians reporting marital status of single and those with dependents of all ages were more likely to report newly acquired burnout. Once adjusted for demographic and clinical variables (e.g., age, gender), the strength of association with marital status was no longer significant, while having adult dependents became the sole dependent age category with increased likelihood of reporting newly acquired burnout. Clinicians with dependents five years or younger were less likely to report burnout when compared to clinicians without dependents (aRR = 0.75 (CI, 0.57–0.98)) (Table 1).

Clinical characteristics independently associated with newly acquired burnout early in the pandemic included practicing in New York City (NYC), having dual roles (patient care and administration), and being employees. Compared to clinicians in solo practice, employees of FQHCs (aRR = 1.7 (CI, 1.2–2.4)) and employees in non-FQHC practices (aRR = 1.4 (CI, 1.0–1.9)) more frequently reported newly acquired burnout (Table 1).

Lack of Control in the Workplace Pre-pandemic

Lack of control in the workplace prior to the pandemic was moderately predictive of who would become burned out early in the pandemic. Prior to the pandemic when no burnout was reported, 94.3% (1,414/1,499) of clinicians reported lacking control on at least one of the eight work-related issues studied. The more work control issues reported by clinicians, the higher the percentage of clinicians reporting newly acquired burnout. This association was statistically significant among clinicians reporting 3 (aRR = 2.3 (CI, 1.4–3.8)) or 4 + (aRR = 2.5 (CI, 2.5–4.1)) work control issues compared to clinicians reporting no work control issues (Table 2).

In bivariate analyses, all eight individual lack of control issues reported prior to the pandemic were associated with newly acquired burnout early in the pandemic. After adjustments for demographic and clinical variables, as well as stress outside of work, we found three lack of control work issues to be significantly associated with newly acquired burnout including lack of control over patient load, work schedule, and standardized quality metrics (Table 3).

Changes in Control at Work from Pre-pandemic to Early Pandemic Period

About a third (35%) of clinicians (519/1,499) reported more lack of control issues (worsening control) early in the pandemic compared to pre-pandemic reports. Of those reporting worsening control, 42% reported newly acquired burnout

Table 1 Demographics and clinical characteristics associated with newly acquired burnout

Demographics	N	Newly Acquired Burnout n (%)	Unadjusted RR (95% CI)	Demographic Factors only Adjusted RR (95% CI)	Demographic & Clinical Factors Adjusted RR (95% CI)
Total population	1499	454 (30%)			
Age (years)					
45 or younger	415	195 (47%)	2.7 (2.2–3.3)***	2.9 (2.3–3.6)***	2.7 (2.1–3.5)***
46 to 55	373	134 (36%)	2.1 (1.7–2.6)***	2.0 (1.6–2.5)***	1.9 (1.5–2.4)***
56 or older	707	123 (17%)	Ref	Ref	Ref
Unknown	4	2 (50%)	2.9 (1.1–7.8)*	2.6 (1.1–6.2)*	2.3 (0.86–6.1)
Gender					
Women	808	303 (38%)	1.8 (1.5–2.1)***	1.4 (1.2–1.7)**	1.4 (1.1–1.6)*
Men	597	127 (21%)	Ref	Ref	Ref
Unknown	94	24 (26%)	1.2 (0.82–1.8)	1.2 (0.78–1.9)	1.2 (0.75–1.8)
Race/ethnicity					
Hispanic	79	27 (34%)	1.1 (0.76–1.5)	0.92 (0.69–1.2)	0.88 (0.66–1.2)
Black, non-Hispanic	102	33 (32%)	0.99 (0.73–1.3)	0.82 (0.61–1.1)	0.78 (0.58–1.1)
Other	90	26 (29%)	0.89 (0.63–1.2)	0.76 (0.55–1.1)	0.79 (0.58–1.1)
Asian	216	48 (22%)	0.68 (0.52–0.89)*	0.58 (0.45–0.76)***	0.61 (0.47–0.79)**
White, non-Hispanic	893	291 (33%)	Ref	Ref	Ref
Unknown	119	29 (24%)	0.75 (0.54–1.0)	0.88 (0.56–1.4)	0.91 (0.58–1.4)
Marital Status					
Single/never married	130	56 (43%)	1.4 (1.1–1.8)*	1.0 (0.81–1.3)	0.99 (0.77–1.3)
Separated, divorced or widowed	132	35 (27%)	0.88 (0.65–1.2)	0.86 (0.66–1.1)	0.87 (0.66–1.1)
Married/domestic partnership	1102	334 (30%)	Ref	Ref	Ref
Unknown	135	29 (22%)	0.71 (0.51–0.99)*	0.73 (0.44–1.2)	0.78 (0.47–1.3)
Type of Dependents[†]					
Infants to five years	185	73 (40%)	1.6 (1.3–2.0)***	0.77 (0.58–1.0)	0.75 (0.57–0.98)*
Middle Childhood 6–11 years	242	108 (45%)	1.8 (1.5–2.2)***	1.2 (0.96–1.5)	1.2 (0.97–1.5)
Teenagers 12–17 years	284	99 (35%)	1.4 (1.1–1.7)*	0.93 (0.75–1.1)	0.96 (0.78–1.2)
Adults 18–64	298	95 (32%)	1.3 (1.0–1.6)*	1.3 (1.0–1.6)*	1.3 (1.0–1.6)*
Adults 65 +	136	53 (39%)	1.6 (1.2–2.0)**	1.4 (1.1–1.8)*	1.4 (1.1–1.7)*
Without dependents	615	154 (25%)	Ref	Ref	Ref
Unknown	110	25 (23%)	0.91 (0.63–1.3)	1.0 (0.63–1.7)	1.0 (0.60–1.7)
Clinical characteristics	N	Newly acquired burnout n (%)	Unadjusted RR (95% CI)	Demographic Factors only Adjusted RR (95% CI)	Demographic and clinical factors adjusted RR (95% CI)
Total population	1499	454 (30%)			
Clinician type					
Nurse practitioner (NP)	304	117 (39%)	1.4 (1.2–1.6)**	–	1.1 (0.94–1.3)
Physician (MD/DO)	1195	337 (28%)	Ref	–	Ref
Location of practice					
New York City	608	203 (33%)	1.2 (1.0–1.4)*	–	1.2 (1.0–1.4)*
Rest of state	891	251 (28%)	Ref	–	Ref
Primary specialty					
Pediatrics	409	134 (33%)	1.2 (0.99–1.4)	–	1.0 (0.85–1.2)
Family medicine	403	129 (32%)	1.2 (0.96–1.4)	–	0.99 (0.83–1.2)
Specialist	51	16 (31%)	1.1 (0.75–1.7)	–	0.95 (0.62–1.5)
Internal medicine	636	175 (28%)	Ref	–	Ref
Administration in addition to patient care					

Table 1 (continued)

Clinical characteristics	N	Newly acquired burnout n (%)	Unadjusted RR (95% CI)	Demographic Factors only Adjusted RR (95% CI)	Demographic and clinical factors adjusted RR (95% CI)
I provide patient care and serve in an administrative role	621	210 (34%)	0.82 (0.71–0.96) *	–	1.3 (1.1–1.5)*
I only provide patient care	878	244 (28%)	Ref	–	Ref
Facility Type and Clinician Role					
Federally Qualified Health Center (FQHC) Employees	135	58 (43%)	2.5 (1.8–3.5)***	–	1.7 (1.2–2.4)*
Employees of non-FQHC practices	910	294 (32%)	1.9 (1.4–2.5)***	–	1.4 (1.0–1.9)*
Practice owners and co-owners (not solo practices)	191	53 (28%)	1.6 (1.1–2.3)*	–	1.4 (0.95–2.0)
Solo practice	231	40 (17%)	Ref	–	Ref
Unknown	32	9 (28%)	1.6 (0.87–3.0)	–	1.3 (0.68–2.4)

*$p < 0.05$, **$p < 0.001$, ***$p < 0.0001$

†Not mutually exclusive

Table 2 Pre-pandemic work control issues associated with newly acquired burnout

Total number of pre-pandemic work control issues	N	Newly acquired burnout n (%)	Unadjusted RR (95% CI)	Adjusted RR (95% CI)
0	85	13 (15%)	Ref	Ref
1	464	96 (21%)	1.4 (0.79–2.3)	1.4 (0.85–2.4)
2	300	79 (26%)	1.7 (1.0–2.9)*	1.6 (0.96–2.7)
3	255	94 (37%)	2.4 (1.4–4.1)**	2.3 (1.4–3.8)*
4 +	395	172 (44%)	2.9 (1.7–4.8)***	2.5 (2.5–4.1)**

*p < 0.05, **p < 0.001, ***p < 0.0001

Adjusted model includes all other independent variables shown in Table 1. Additionally, the model is also adjusted for responses to the question of whether "I experienced a lack of enough time or energy for work due to responsibilities outside of work, including the needs of my family"

Table 3 Pre-pandemic work control issues associated with newly acquired burnout early in the pandemic

Work control issues	N	Newly acquired burnout n (%)	Unadjusted RR (95% CI)	Adjusted RR (95% CI)
No work control issues	85	13 (15%)	Ref	Ref
Patient load	469	197 (42%)	2.7 (1.6–4.6)**	1.1 (1.0–1.2)*
Time allotted to see patients	413	174 (42%)	2.7 (1.6–4.6)**	–
Work schedule	484	198 (41%)	2.7 (1.6–4.5)**	1.2 (1.1–1.3)**
Medical decisions for patients	182	67 (37%)	2.4 (1.4–4.2)*	–
Length of stay	205	72 (35%)	2.3 (1.4–3.9)*	–
Insurance coverage	917	284 (31%)	2.1 (1.2–3.4)*	–
Standardized quality metrics	475	181 (38%)	2.5 (1.5–4.1)**	1.1 (1.1–1.2)*
Compensation	636	229 (36%)	2.3 (1.4–3.9)*	–

*p < 0.05, **p < 0.001 ,***p < 0.0001

Adjusted model includes all other independent variables shown in Table 1. Additionally, the model is also adjusted for responses to the question of whether "I experienced a lack of enough time or energy for work due to responsibilities outside of work, including the needs of my family"

Table 4 Change in work control issues early in the pandemic associated with newly acquired burnout

Change in total number of work control issues	N	Newly acquired burnout n (%)	Unadjusted RR (%95 CI)	Adjusted RR (%95 CI)
Improvement	243	60 (25%)	1.0 (0.81–1.3)	0.91 (0.71–1.2)
Worsening	519	219 (42%)	1.8 (1.5–2.1)***	1.4 (1.2–1.6)***
No change	737	175 (24%)	Ref	Ref

*p < 0.05, **p < 0.001, ***p < 0.0001

Adjusted model includes all other independent variables shown in Table 1, pre-pandemic lack of control factors, and responses to the question of whether "I experienced a lack of enough time or energy for work due to responsibilities outside of work, including the needs of my family"

compared to 24% of those reporting no change in the number of control issues (aRR = 1.4 (CI 1.2–1.6)) (Table 4).

In bivariate analyses, all but one of the eight reported changes in work control issues were associated with newly acquired burnout. Multivariate analyses found that changes in four work control issues were predictive of newly acquired burnout beyond that accounted for by demographic and clinical characteristics, pre-pandemic work issues, and change in demands outside of work. This finding of higher burnout incidence with emerging self-perceived control issues held specifically for clinicians reporting worsening control over patient load, work schedule, medical decisions for patients, and compensation. Once adjusted for other factors, clinicians reporting continuous work control issues were not significantly more likely to report newly acquired burnout than those reporting control at work continued or improved.

Discussion

Recent reports suggest the COVID-19 pandemic caused a dramatic increase in burnout among primary care physicians and NPs [4, 20–23]. Even before the pandemic, clinicians reported substantial stress and burnout due to health care system changes characterized by fragmentation, reduced autonomy, increased workload, and an emerging era of oversight where work is tracked, scored, measured, and reported [37–42]. In this study, we utilized the retrospective cohort study design and collected information in the pre-pandemic and early pandemic period to investigate factors associated with newly acquired burnout early in the pandemic. We measured the impact of pre-existing demographic and clinical variables, pre-pandemic work control issues, and changes in work control issues during the early pandemic period.

Characteristics associated with newly acquired burnout in primary care clinicians in this study are consistent with prior studies and include women, clinician age younger than 56 years old, having adult dependents, practicing in NYC, having dual roles (patient care and administrative), and being an employee [43–46].

We found that lack of control over several work-related issues prior to the pandemic was associated with reporting newly acquired burnout during the early pandemic. However, some of these associations were attenuated in multivariate models after accounting for all eight work control issues together. Patient load, work schedule, and standardized quality metrics remained significant in multivariate analyses, which may represent work issues of interest when considering improvement of the practice environment and mitigation of clinician burnout.

Additionally, our findings suggest that the COVID-19 pandemic may have been the tipping point event that changed the burnout status of clinicians who were not burned out prior to the pandemic [1, 2]. Following the onset of the pandemic we found that emerging work control issues, not reported pre-pandemic and reported during the early pandemic, were associated with newly acquired burnout. The emergence of notable work control issues, including lack of control over patient load, work schedule, medical decisions for patients, and compensation, could be areas where organizations and policy makers focus their attention in the future. While previous research has shown that persistent stressors can have cumulative effects on employee wellness [30] our study found that clinicians with continuous work control issues were not significantly different in reporting newly acquired burnout compared to clinicians with improved work control environments or no work control issues (Table 5).

Patient load has been found to be related to burnout regardless of age, gender, practice setting, and specialty [30]. Although it is understood that mental stresses are common in the health professions, patient load demands and expectations are systems-based constructs that are modifiable. In our study, following the pandemic's onset, newly acquired burnout was associated with the emergence of lack of control over patient load. Our results reinforce the importance of workload management as a strategy for mitigating the effects of burnout, namely through focusing on systems design and workplace culture. Improving patient flow and adjusting for work quantity and pace may provide opportunities for policymakers and health care delivery systems to improve clinician professional satisfaction [45, 46].

Several studies have shown significant associations between work schedule and burnout among health care

Table 5 Change in work control issues early in the pandemic associated with newly acquired burnout

Work control issues	N	Newly acquired burnout n (%)	Unadjusted RR (%95 CI)	Adjusted RR (%95 CI)
Patient load				
Lack of control emerged	205	92 (45%)	2.2 (1.8–2.7)***	1.5 (1.2–1.8)**
Lack of control continued	401	176 (44%)	2.2 (1.8–2.6)***	1.4 (0.90–2.0)
Control remained or improved	893	179 (20%)	Ref	Ref
Time allotted to see patients				
Lack of control emerged	153	64 (42%)	1.8 (1.4–2.2)***	–
Lack of control continued	317	140 (44%)	1.8 (1.6–2.2)***	–
Control remained or improved	1029	247 (24%)	Ref	–
Work schedule				
Lack of control emerged	208	100 (48%)	2.3 (1.9–2.8)***	1.3 (1.1–1.6)*
Lack of control continued	371	167 (45%)	2.2 (1.9–2.6)***	1.2 (0.89–1.7)
Control remained or improved	920	184 (20%)	Ref	Ref
Medical decisions for patients				
Lack of control emerged	175	88 (50%)	1.9 (1.6–2.3)***	1.4 (1.1–1.6)*
Lack of control continued	137	49 (36%)	1.4 (1.1–1.7)*	0.91 (0.61–1.4)
Control remained or improved	1187	321 (27%)	Ref	Ref
Length of stay				
Lack of control emerged	112	44 (39%)	1.4 (1.1–1.8)*	–
Lack of control continued	165	58 (35%)	1.2 (0.97–1.5)	–
Control remained or improved	1222	354 (29%)	Ref	–
Insurance coverage				
Lack of control emerged	99	34 (34%)	1.2 (0.90–1.6)	–
Lack of control continued	725	232 (32%)	1.1 (0.95–1.3)	–
Control remained or improved	675	189 (28%)	Ref	–
Standardized quality metrics				
Lack of control emerged	118	43 (36%)	1.4 (1.1–1.8)*	–
Lack of control continued	376	150 (40%)	1.5 (1.3–1.8)***	–
Control remained or improved	1005	261 (26%)	Ref	–
Compensation				
Lack of control emerged	145	60 (41%)	1.7 (1.3–2.1)***	1.3 (1.1–1.7)*
Lack of control continued	551	204 (37%)	1.5 (1.3–1.8)***	1.1 (0.80–1.4)
Control remained or improved	803	193 (24%)	Ref	Ref

*$p < 0.05$, **$p < 0.001$, ***$p < 0.0001$

Adjusted model includes all other independent variables shown in Table 1, pre-pandemic lack of control factors, and responses to the question of whether "I experienced a lack of enough time or energy for work due to responsibilities outside of work, including the needs of my family"

workers [7, 47]. In our study, following the onset of the pandemic, newly acquired burnout was associated with the emergence of lack of control over work schedule. Recent studies have shown that providing non-clinical time within weekly schedules in flexible time-off programs improved overall wellness among trainees [48]. Perhaps consideration should be given to interventions that allocate resources towards the review of scheduling procedures to provide more flexibility to clinicians [49, 50].

In considering tools to adjust workload and improve the ability of clinicians to provide optimal care, standardization and consolidation of similar work streams has the potential to positively improve patient outcomes. Current standardized quality metrics were designed to improve patient outcomes or experience of care. However, there are barriers reported by clinicians in effectively leveraging quality metrics including poorly designed metrics, growing reporting burden, and lack of trust in the data [7, 51, 52]. The accuracy of metrics is important because they are used to judge performance, drive quality improvement efforts, and set physician compensation [42, 52]. Prioritization of interventions addressing these barriers may include using a limited set of measures that are most important and clinically relevant for improving outcomes, as well as consolidating multiple reporting

systems [42, 51, 52]. Utilization of automated health information exchange systems to collect clinical data for quality measures across settings and the inclusion of clinicians input into EHR system designs for more user-friendly interfaces may be considered [42, 52, 53].

Two of our study findings may represent issues related to the unique environment surrounding the COVID-19 pandemic. Following the pandemic onset, newly acquired burnout was associated with the emergence of lack of control over medical decisions of patients as well as lack of control over compensation. Considering the multiple and rapid pressures of the pandemic, the medical decision-making process of clinicians may have been impacted by practice-specific changes in patient scheduling, visit preparation, and patient assessments dictated by age and risk factors [54]. There were also direct and indirect medical decisions clinicians had to consider for their patients, including the potential health effects of treatment interruptions, uncontrolled chronic disease, cancer screening, mental illness, as well as delays in the delivery of evidence-based care during the pandemic (e.g., elective surgeries being cancelled, preventive screening being halted) [55, 56]. The compensation control issue may be due to the fear of closures and may represent reactions to how practices responded to the pandemic-imposed restrictions to preserve their economic viability [55, 57]. Additionally, there was uncertainty surrounding the emergence of telehealth utilization and the impact it would have on compensation [19, 57–59].

Limitations

This study has several limitations. The response rate was low, and while this is typical of internet-based clinician studies [60, 61], we did not attempt to estimate the prevalence of burnout. Additionally, selective participation may impact generalization. However, relevant demographic and clinical groups are represented in this study. The distribution of gender (Women: 54% vs. 55%) and provider type (MD: 76% vs. 76%) are similar between survey respondents and the source population identified by the PNDS, respectively. There are slight differences in practice region (NYC: 41% vs. 35%) and age group categories whereby our study participants were older (>45 years old: 68% vs. 56%).

This study explored a number of demographics, clinical characteristics, and work control issues hypothesized to be associated with newly acquired burnout. There are likely to be additional factors and possibly unobserved confounders beyond those measured in this study that influence burnout. The validated burnout measure utilized in this manuscript focuses on the exhaustion dimension of burnout. Future research should explore additional factors likely to impact other dimensions of burnout (e.g., cynicism) and the effects of this on clinicians and the patients they serve. The questionnaire did not include questions on inpatient and outpatient setting; thus, we are unable to consider this as a factor contributing to increased risk for burnout during the early phase of the COVID-19 pandemic.

This retrospective cohort study collected all data at one time point in August 2020 during the early pandemic period. Thus, these results may not accurately reflect burnout at all time points during the COVID-19 pandemic. Additionally, recall bias is also possible and newly acquired burnout may have played a role in the recall of work issues.

Conclusions

Burnout reporting increased among primary care clinicians during the early COVID-19 pandemic, partially due to varied and numerous work environment and systemic factors. Workforce well-being and retention programs can be designed with greater specificity as modifiable risk factors were found in this study that contributed to newly acquired burnout among primary care clinicians. Adopting policies aimed at creating more flexible and responsive work environments may be helpful in mitigating burnout.

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Declarations

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