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Full practice authority and burnout among primary care nurse practitioners

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ABSTRACT

Background: Full practice authority (FPA) improves clinical autonomy for nurse practitioners (NPs). Autonomy may reduce burnout.
Purpose: Estimate the effect of changing from reduced or restricted practice authority to FPA on NP burnout.
Methods: In this quasi-experimental study, we compared NP burnout before (2016) and after (2018) a Veterans Health Administration (VHA) regulation authorized NP FPA. Burnout proportions were estimated for VHA facilities by aggregating responses to the VHA's All Employee Survey from 1,352 primary care NPs.
Discussion: Seventy-seven percent of facilities changed to FPA postregulation. Burnout was six points lower among NPs in facilities that changed to FPA compared to facilities that had FPA prior to the regulation; however, this association was not statistically significant.
Conclusion: NPs are increasingly working under independent practice. While changing to FPA did not reduce NP burnout, this association may vary by health care setting or when burnout is measured for individuals or teams.

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Introduction

Burnout is an occupational condition characterized by mental, emotional, and physical responses to stressors at work (Bakker et al., 2014). It is commonly experienced as emotional exhaustion, depersonalization, or a sense of cynicism toward work, and feelings of reduced effectiveness or accomplishment at work (Cordes & Dougherty, 1993; Maslach & Leiter, 2008). In the health care work environment, burnout is often the product of excessive demands (Montgomery et al., 2019; Shah et al., 2021; West et al., 2018), and an estimated one-quarter to one-third of nurse practitioners (NPs) report job-related burnout (Abraham et al., 2021a, 2021b; Dyrbye et al., 2020).

Professional autonomy—the flexibility to use one's skills and resources independently—may counter job demands and be protective against burnout (Bakker et al., 2014). The job demands-resources (JD-R) model of occupational wellbeing—a common framework for burnout—describes how job resources balance with job demands to influence burnout (Bakker et al., 2014). The JD-R model conceptualizes job demands as stress-inducing and job resources as stress-reducing aspects of work (Bakker et al., 2014; Brauchli et al., 2015). Autonomy is generally viewed as a job resource (Bakker et al., 2014), and in other health care professions, such as for physicians, autonomy is correlated with lower burnout (Bakker et al., 2014; Shirom et al., 2010).

While the JD-R model is implicitly an employee-level model of job-related stress, an individual's professional autonomy often has

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important institutional or systemic origins. For NPs, autonomy varies significantly by the practice authority with which they work and treat patients (Park et al., 2018). In the U.S., NP practice authority is typically written into nurse practice acts at the state level. Some states grant full practice authority (FPA) to NPs, while other states reduce or restrict their practice authority (Kuo et al., 2013). FPA regulations authorize NPs to evaluate patients, prescribe medications, and manage treatments as independent providers (Kuo et al., 2013). In contrast, reduced and restricted practice authority regulations specify limitations on NP practice and autonomy (Park et al., 2018). Restricted practice authority requires career-long physician supervision in one or more domains of practice, such as through physician collaboration agreements, prescribing oversight, and limited hospital privileges (Kuo et al., 2013; Ortiz et al., 2018). Reduced practice authority generally requires career-long physician collaboration for prescribing authority, particularly for controlled substances (Kuo et al., 2013; Ortiz et al., 2018). FPA, in comparison, allows NPs maximum autonomy to treat and prescribe at the top level of their education and training (Park et al., 2019).

Research is limited on state-level practice authority regulations and autonomy, but previous findings suggest that these regulations affect NPs' day-to-day job autonomy (Park et al., 2018). Park and colleagues found that FPA was positively associated with a range of indicators of greater day-to-day practice autonomy for NPs, including NPs feeling that their skills were fully utilized and that relationships with physicians were collaborative rather than hierarchical (Park et al., 2018). A qualitative study of NPs in six states representing a wide variation in NP practice authority concluded that practice authority regulations had substantial indirect impacts related to NP autonomy, including whether an NP was recognized as a primary care provider (PCP), was listed as a provider in health plan networks, could bill for services independently, and had limitations on service geography due to physician collaboration requirements (Yee et al., 2013).

Increased autonomy associated with FPA may act as a stress-reducing job resource for NPs, yet little is known about NP burnout in relation to FPA regulations (Hoff et al., 2019). Prior research finds that FPA is associated with higher job satisfaction and retention among NPs (Choi & de Gagne, 2016; Faris et al., 2010; Han et al., 2018; Hoff et al., 2019). The only study we are aware of correlating NP job autonomy with burnout observed an association between independent NP practice environment (though not FPA specifically) and lower burnout (Abraham et al., 2021b). However, this study was conducted in two states, limiting generalizability. It also used a single survey to assess practice environment and burnout, potentially inflating associations due to method bias (Lance et al., 2010); method bias arises from assessing the exposure and outcome with the same instrument and can be avoided by using independent data sources for these variables. This study, like most research on potential drivers of burnout, relied on a cross-sectional design, which is susceptible to confounding and limits causal inference.

To address these gaps, we aimed to assess the effect of changing from reduced or restricted practice authority to FPA on burnout among NPs employed in primary care using a quasi-experimental study design. In 2017, the Veterans Health Administration (VHA) implemented a federal regulation authorizing FPA for all NPs employed within the VHA. We used this regulatory change to test the potential of a system-wide change in autonomy on burnout. While this VHA regulation was not implemented to address burnout directly, such policy changes may affect workers in unexpected ways, like through burnout. This regulation offered an opportunity to test whether VHA facilities changing to FPA observed a simultaneous reduction in burnout among NPs in the VHA's primary care workforce. These findings may be of interest to the VHA administration and clinical workforce, but they may also be informative for other health systems or clinicians within states undergoing practice authority rule changes.

Methods

Setting and Study Design

In this quasi-experimental study, we linked facility-level estimates of burnout among NPs working in primary care at the VHA to the practice authority regulations covering the facilities where they worked. The VHA serves over 9 million Veterans who are enrolled in care at medical facilities nationwide (Veterans Health Administration, 2022). Each VHA facility is comprised of a medical center and a network of community-based outpatient clinics. Some states, like Alaska, have one facility, while other more populous states have multiple facilities. A VHA facility may also cover multiple states, with community-based outpatient clinics located in neighboring states to where the facility's central medical center is located.

The VHA is one of the largest integrated health systems in the U.S. and has an organizational commitment to improve workforce well-being (Reddy et al., 2022). In 2017, the VHA's Advanced Practice Registered Nurse (APRN) FPA regulation designated all VHA NPs as licensed independent practitioners (Department of Veterans Affairs, 2016). This regulation addressed the confusion created by NPs operating under disparate state licensing within VHA facilities. As federal employees, NPs may hold licensure in any state and practice within the VHA despite the location (or state) of the facility. Prior to the passage of the APRN FPA regulation, NPs provided care to the extent allowed by their NP license. When NPs practiced at VHA facilities in states different from their licensing state, they could work side-by-side with NPs who had different practice authority, which created challenges for patient care. The APRN FPA regulation fostered consistency in care delivery for Veterans treated by VHA NPs.

As of 2016, 22 states and the District of Columbia licensed NPs with FPA (Centers for Disease Control and Prevention & U.S. Department of Health and Human Services, 2016), with the remaining states regulating reduced or restricted practice authority. After its passage, the APRN FPA regulation superseded state NP practice laws and regulations for VHA-employed NPs in the states that had not approved NP FPA. An exception in the regulation was made for controlled substance prescribing, which falls under the Federal Controlled Substances Act (United States Drug Enforcement Administration, 2018). VHA NPs must prescribe controlled substances to the extent allowed within the practice authority of their state licensure. While the APRN FPA regulation applied to all VHA NPs, this analysis was limited to burnout among NPs in primary care (NP Facts, 2022).

Data Sources

The units of analysis in this study were VHA facilities. We used state laws and NP practice authority regulations in 2016 (Centers for Disease Control and Prevention & U.S. Department of Health and Human Services, 2016) to determine whether each VHA facility changed from reduced or restricted practice authority to FPA or had FPA throughout the study. Facilities were grouped using a binary indicator for whether they were in reduced or restricted practice authority states or FPA states in 2016, prior to the enactment of the regulation. Reduced and restricted practice authority facilities were grouped together since their states' laws and regulations restricted at least one aspect of NP practice authority. Previous research observed little distinction between reduced and restricted practice on determinants of day-to-day autonomy for NPs (Park et al., 2018).

Practice authority data was then linked to burnout estimates for VHA facilities. Facility-level estimates of burnout among NPs were calculated by aggregating responses to questions on burnout from the All Employee Survey, the VHA's annual workforce survey. The All Employee Survey is an anonymous survey that the VHA uses to identify organizational strengths and needs based on employee perceptions (U.S. Department of

Veterans Affairs, 2021). The survey assesses workplace climate, employee attitudes like job satisfaction, and other workforce outcomes like turnover intention and burnout. Burnout was estimated as the proportion of primary care NP respondents reporting burnout at a facility in a year. Demographic and occupational questions from the survey were also included.

For this study, individual survey responses were aggregated to the facility level for each year in the study (i.e., facility-year measures). To assess burnout before and after the APRN FPA regulation, aggregate survey responses for the 2016 and 2018 survey years were linked into a serial cross-sectional data set using a facility identifier. The All Employee Survey is conducted each spring, and we chose to exclude the 2017 All Employee Survey year due to the short period between the spring deployment of the 2017 survey and the implementation of the VHA's FPA regulation in January 2017. Thus, postregulation measurements lagged by 1 year and were derived from the 2018 All Employee Survey. Survey response rates for all VHA employees were 57% in 2016 and 62% in 2018 (U.S. Department of Veterans Affairs, 2018; VHA National Center for Organization Development, 2017). NP-specific response rates to the All Employee Survey were not available to the study team.

Facility Sample

The initial sample for this study included 138 VHA facilities with medical centers located in U.S. states. Preliminary exclusion criteria excluded three VHA facilities in Arizona and Minnesota which had not changed to NPs FPA for NPs by 2016, despite Arizona and Minnesota allowing FPA at that time. Twelve additional facilities were excluded due to inconsistency in state-level NP practice regulations within a multi-state facility (e.g., when a facility's medical center was in an FPA state, but the facility had outpatient clinics in reduced or restricted practice authority states). After these exclusions, 123 VHA facilities remained in the data set.

To improve the accuracy of aggregate measurements and reduce the variability inherent in using a single observation of a dichotomous outcome (e.g., facility-level burnout proportion), a minimum of three respondents per facility was required for aggregation of All Employee Survey measures. Thus, some facilities provided information for only one of the two survey years or not at all if too few NPs responded to the survey. For the aggregation of survey measures, we selected survey respondents who self-identified on the survey as being an NP and a member of a primary care team, also called a Patient-Aligned Care Team within the VHA (Rosland et al., 2010). Based on the minimum aggregation requirement, 27% of the remaining facilities were excluded in 2016 (n = 33), and 20% of facilities were excluded in 2018 (n = 25). The final sample included survey responses aggregated from 610 NPs at 90 facilities in 2016 and 742 NPs at 98 facilities in 2018.

Burnout Outcome

The All Employee Survey measures burnout using single questions to assess emotional exhaustion, depersonalization, and reduced achievement. These questions align with the three burnout dimensions defined in the Maslach Burnout Inventory (MBI), which is commonly used in burnout research (Dewa et al., 2017; Schaufeli et al., 2001). While the MBI uses multiple questions for each burnout dimension, distilling these series of questions for the exhaustion and depersonalization dimensions into two single items produced valid estimates of burnout in medical staff (West et al., 2012). Using more than one dimension of burnout to accurately assess burnout is recommended (Brenninkmeijer & VanYperen, 2003; Waddimba et al., 2016). Following previous studies (Rinne et al., 2020; Sterling et al., 2021), we used the emotional exhaustion ("I feel burned out from my work") and/or depersonalization ("I worry that this job is hardening me emotionally") questions in the All Employee Survey to measure burnout. These questions are answered using a Likert scale of frequency of symptoms: never, a few times a year or less, once a month or less, a few times a month, once a week, a few times a week, or every day, and respondents screened positive for burnout by answering once a week or more often on these questions. This approach dichotomized burnout as yes or no for each survey respondent. Individual responses were aggregated for each facility, and facility-level burnout was calculated as the proportion of NPs at a facility who screened positive for burnout.

Covariates

Three aggregate All Employee Survey variables were used to describe self-reported gender (male or female), age, and tenure characteristics of NP populations at VHA facilities. Responses were aggregated at the facility level as the proportions of NP respondents who were female, less than 50 years old, and with short tenure at the VHA (i.e., a VHA tenure of less than 5 years). In prior research, being female, of younger age, and shorter tenure were associated with burnout in NPs and physicians (Breaux et al., 2008; Cordes & Dougherty, 1993). We included these covariates in our analyses to improve the precision of parameter estimates for burnout.

Statistical Analyses

Facilities included in the final sample were described before and after the FPA regulation in 2016 and 2018, respectively. Defining facilities based on their 2016 practice authority categories, NP burnout was plotted for reduced or restricted FPA facilities preregulation and postregulation. Linear regression models were used to perform a difference-in-differences (DID) analysis estimating the effect of a change from reduced or restricted practice authority to FPA on NP burnout.

DID analyses are commonly used to estimate the effect of policies on health outcomes (Wing et al., 2018), particularly in research settings where experimental techniques are infeasible. DID models improve causal inference by accounting for background trends in the outcome through the use of a comparison group unexposed to the policy (Dimick & Ryan, 2014). In this study, DID models measured the comparative change in burnout over time between VHA facilities changing from reduced or restricted practice authority to FPA (the treatment group) relative to VHA facilities with FPA prior to the policy change (the comparison group) (Strumpf et al., 2017). The comparison group provided a counterfactual trajectory in NP burnout that would be expected in the absence of the regulation change for reduced or restricted practice facilities. We relied on two assumptions for our models, which are common in DID methodology. We assumed the annual burnout trends of the treatment and comparison facilities were parallel prior to the regulatory change and that other factors/events influencing burnout during the study period were similar between the two groups of facilities (i.e., the common shocks assumption) (Wing et al., 2018).

The base regression model, model 1, included the indicator for practice authority designation (reduced or restricted practice authority vs. FPA), an indicator for preregulation or postregulation (i.e., year), and a term for their interaction. This interaction term estimated the DID effect of changing from reduced or restricted practice authority to FPA on the proportion of NP burnout at VHA facilities. In model 2, the adjusted regression model, we included the terms described in the base model and added facility-level indicators for gender, age, and tenure of NPs at VHA facilities. Heteroskedastic robust standard errors, accounting for the clustering of observations by facility, were estimated. Marginal means and 95% confidence intervals (CIs) of burnout proportions and DID estimates were calculated for both models. The VA Puget Sound and University of Washington Institutional Review Boards approved this study. All

Table 1
Characteristics of VHA Facilities

	Before the VHA FPA Regulation (2016)	After the VHA FPA Regulation (2018)
	n = 90*	n = 98*
Facility sample		
Facilities categorized as reduced or restricted practice authority states in 2016, n (%)	69 (77)	75 (77)
Facilities in FPA states, n (%)	21 (23)	23 (77)
All Employee Survey respondents		
Total primary care NP respondents	610	742
NP respondents at a facility, mean (SD)	7 (4)	8 (4)
Facility-level proportion of NP respondents who were female, mean (SD)	0.84 (0.16)	0.83 (0.16)
Facility-level proportion of NP respondents under 50 years of age, mean (SD)	0.35 (0.26)	0.42 (0.23)
Facility-level proportion of NP respondents with short VHA tenure (< 5 years), mean (SD)	0.46 (0.25)	0.44 (0.23)

Note. FPA, full practice authority; NP, nurse practitioner; SD, standard deviation; VHA, Veterans Health Administration.
* Inclusion criteria for facilities in each survey year required that there were at least 3 NP respondents per facility.

analyses were performed using Stata software (version 17, StataCorps LLC) (StataCorp, 2021).

Results

The facility sample is described in Table 1. For the study sample, 77% of VHA facilities were in states that changed from reduced or restricted practice authority to FPA after the APRN FPA regulation. The remaining 23% of facilities in 2016 (n = 21) and 23% of facilities in 2018 (n = 23) were in states with FPA prior to the regulation. In 2016, 610 NPs in our facility sample completed the All Employee Survey, with a mean of 7 respondents per facility (standard deviation [SD]: 4). The proportion of NPs who were female was 0.84 (SD: 0.16), who were under 50 years old was 0.35 (SD: 0.26), and who had VHA tenures shorter than 5 years was 0.45 (SD: 0.25). In 2018, 742 NPs in our facility sample completed the All Employee Survey, with a mean of 8 respondents per facility (SD: 4). The proportion of NPs who were female was 0.83 (SD: 0.16), who were under 50 years old was 0.42 (SD: 0.23), and who had VHA tenures shorter than 5 years was 0.44 (SD: 0.23).

Figure 1 illustrates the preregulation to postregulation decrease in unadjusted burnout among facilities that changed to FPA compared to facilities with FPA prior to the APRN FPA regulation. The proportion of burnout among NPs at facilities that changed to FPA decreased more from 2016 to 2018 than for NPs in facilities previously allowing FPA for NPs. Table 2 presents the burnout estimates and DID results for the base and adjusted linear regression models. Base estimates of burnout for facilities that changed to FPA decreased from 0.47 (95% CI [0.41, 0.53]) before the regulation to 0.35 (95% CI [0.30, 0.40]) after the regulation (model 1). For facilities with FPA prior to the regulation, burnout decreased from 0.50 (95% CI [0.38, 0.63]) before the regulation to 0.43 (95% CI [0.34, 0.53]) after the regulation.

Adjusted burnout estimates (model 2) were similar to those in the base models. Adjusted estimates of burnout for facilities that changed to FPA decreased from 0.47 (95% CI [0.41, 0.53]) before the VHA regulation to 0.34 (95% CI [0.29, 0.39]) after the regulation. For facilities with FPA prior to the regulation, burnout decreased from 0.50 (95% CI [0.38, 0.63]) before the regulation to 0.44 (95% CI [0.34, 0.54]) after the regulation. The DID effect estimated that, after the regulation, the NP burnout proportion was six points lower (DID coefficient = 0.06, 95% CI [−0.22,

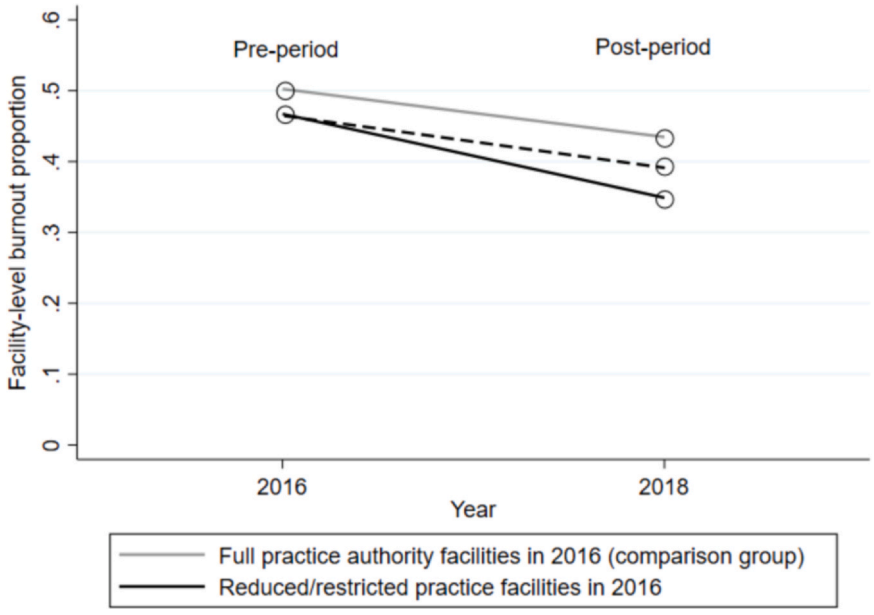

Figure 1. Comparison of nurse practitioner (NP) burnout between facilities with reduced or restricted NP practice authority compared to facilities with full practice authority (FPA) for NPs before and after the Veterans Health Administration NP FPA regulation. The dotted line represents the hypothetical trajectory of NP burnout if reduced or restricted practice authority facilities where not granted FPA.

Table 2
Difference-in-Differences Estimates of the Effect of FPA on NP Burnout at the VHA

Group	Before the VHA FPA Regulation (2016)	After the VHA FPA regulation (2018)	Difference From 2016 to 2018
	Burnout Proportion [95% CI]	Burnout Proportion [95% CI]	Difference in Burnout Proportion [95% CI]
Base model (model 1)			
Reduced or restricted practice authority facilities (treatment group)	0.47 [0.41, 0.53]	0.35 [0.30, 0.40]	−0.12 [−0.18, −0.05]
Full practice authority facilities (comparison group)	0.50 [0.38, 0.63]	0.43 [0.34, 0.53]	−0.07 [−0.21, 0.07]
Difference between reduced/restricted and full practice authority facilties	−0.04 [−0.17, 0.10]	−0.09 [−0.19, 0.02]	**−0.05 [−0.20, 0.10]**
Adjusted model (model 2)[*]			
Reduced or restricted practice authority facilities (treatment group)	0.47 [0.41, 0.53]	0.34 [0.29, 0.39]	−0.13 [−0.20, −0.06]
Full practice authority facilities (comparison group)	0.50 [0.38, 0.63]	0.44 [0.34, 0.54]	−0.06 [−0.21, 0.08]
Difference between reduced/restricted and full practice authority facilities	−0.03 [−0.17, 0.10]	−0.10 [−0.21, 0.01]	**−0.06 [−0.22, 0.09]**

Note. FPA, full practice authority; NP, nurse practitioner; VHA, Veterans Health Administration.
Bolded estimate is the difference-in-difference estimate of the effect of authorizing FPA on NP burnout.
[*] Model adjusted for the proportion of NP survey respondents who were < 50 years of age, female, and had a VHA tenure < 5 years.

0.09]) among facilities that changed from reduced or restricted practice authority to FPA compared to facilities with FPA prior to the regulation; however, this effect was not significant. The regression coefficients were reported in Appendix Table A1 for both models.

Discussion

After implementation of the VHA's APRN FPA regulation, NPs employed at VHA facilities in reduced or restricted NP practice authority environments gained FPA privileges. In this study, we did not observe a significant association between a change in practice authority and the prevalence of burnout among NPs at the VHA. However, the absolute difference in burnout was a 6% greater decline in burnout for facilities affected by the change to FPA compared to facilities with FPA prior to the regulation. While not significant, this difference is large, and further research is needed to assess the extent to which gaining FPA affects NP burnout.

To our knowledge, this is the first study to assess a change in burnout in response to a change in NP practice authority. Most new FPA regulations occur state-by-state, but the VHA's FPA regulation resulted in a nationwide change for VHA staff. Using multiyear VHA data offered a unique opportunity to assess NP burnout in a national sample. Our findings contrast with a prior study that observed a significant association between independent NP practice and lower NP burnout (Abraham et al., 2021b). That study focused on two states, Pennsylvania and New Jersey, and nested their measure of practice autonomy within a broader measure of practice environment. In our study, we were able to isolate the effect of practice authority changes on burnout by applying DID methods after a definitive practice authority policy change. This is advantageous for states planning or contemplating the implementation of these types of regulatory changes.

NP practice authority regulations cross-cut health care specialties, but our findings are particularly informative for the primary care sector. Many NPs (40%–70%) are employed in primary care practice and make up a critical portion of the PCP workforce (NP Facts, 2022; Naylor & Kurtzman, 2010; O'Reilly-Jacob et al., 2022). The move to FPA is driven by many factors, including the need to improve access to care and alleviate PCP shortages, particularly in rural areas where PCP shortages are pronounced (DePriest et al., 2020; Iglehart, 2013; Kandrack et al., 2021; Yang et al., 2021). As a result, many FPA studies evaluate factors like access and workforce shortages. Few studies specifically assess FPA's relation to burnout (Abraham et al., 2021b; Choi & de Gagne, 2016; Naylor & Kurtzman, 2010; Xue et al., 2016; Yang et al., 2021). While we did not observe significant changes in burnout correlated with a change to FPA in VHA primary care, future studies could implement study designs that follow NPs longitudinally as more states make similar changes.

The absence of a statistically significant association between the change in FPA and burnout observed in this study may be influenced by several factors. To create a serial cross-sectional sample from the available data, we aggregated individual-level burnout measures to the facility level, resulting in some loss of information. We dichotomized burnout, which limits the level of information included. Even though the overall samples were quite large, there were relatively small numbers of NP respondents at many of the facilities. There were likely differences in work environments among the facilities studied, unrelated to the scope of practice change, that may have affected burnout. We did not adjust for other work environment variables, as this may have biased the results toward the null. More research is needed on how NPs adapt to changes in practice authority as burnout may vary over time in response to changes in autonomy, including on acceptance of their new role within the VHA (Torrens et al., 2020). Though our results were null, assessing burnout longitudinally at the individual NP or team level over time, with better adjustment for other work environment factors, may strengthen the correlation between changes in practice authority and burnout.

Our study may also be unique in that the prevalence of NP burnout in this study was higher than previously observed. Upwards of 50% of NPs at FPA facilities prior to the regulation reported burnout. This was greater than the one-quarter to one-third of NPs with burnout observed in non-VA settings (Abraham et al., 2021a, 2021b; Dyrbye et al., 2020). Drivers of burnout among NPs at the VHA, a capitated health care system providing team-based care to a complex patient population, may be different than in other health care settings (Helfrich et al., 2017), affecting the generalizability of these results. The overall decline in NP burnout at VHA facilities from before to after the regulation suggests that other factors influential to NP burnout may have occurred during the study. It is also possible that methods used to assess burnout in this study were not sensitive enough to pick up a significant association with a change in FPA.

Variations in how the new regulation was implemented across VHA facilities and between NPs and their physician colleagues

must also be considered. Through the regulation, all VHA facilities were encouraged to implement FPA for NPs, though this was not mandated until 2019. While we excluded facilities that did not license NPs as independent providers, other facilities in our final sample, or individual providers, may not have changed their practice patterns to reflect the new regulation despite the facility's intention. Also, while practice authority policies set clear boundaries on practice requirements, professional autonomy may still vary by individual NP–physician collaboration or organization. Translation of practice authority regulations into practical workflow and meaningful physician collaboration may vary widely, with some NPs experiencing substantial independence despite practice restrictions. This may manifest through workarounds reducing time-consuming requirements or due to time-earned trust from physicians. A study of VHA advanced practice nurses found that autonomy increased with tenure at the VHA (Faris et al., 2010). These variations in autonomy were not reflected in our practice authority assignment and could dampen the effect of the practice authority change on NP autonomy. While we adjusted for average NP tenure at a facility, there are likely other factors we did not adjust for that influence NP autonomy and could introduce bias. Future research may consider more variability in the practice environment when assessing associations between professional autonomy and burnout.

In the U.S., NP practice authority is trending toward more independence for NPs. Adjustments to NP professional autonomy are characteristic of these policy changes, though practice policies are not the sole determinant of NP autonomy. An in-depth qualitative study of the experience of NPs about their autonomy before and after a change in practice authority may elucidate how and when NP autonomy changes. NPs' practice authority changes may also affect burnout in other clinical staff like physicians and nurses, but little is known about this. While there may be few other opportunities to observe a nationwide change in FPA policy, studying NP burnout before and after changes to state practice regulations could enhance our understanding of practice autonomy on NP well-being.

Study Limitations

A primary limitation of this study was data aggregation. All Employee Surveys were anonymous, so to create the serial cross-sectional data set, data from individual respondents were aggregated to the facility level. Consequently, individual-level information was lost. This may contribute to why we failed to find a significant change, though the absolute decline in burnout was notable. There was also potential for misclassification of practice authority designation for survey respondents. Practice authority may have differed between the state of licensure for an NP and at the NP's employing facilities. Survey responses were aggregated by facility, so some NPs at each facility were likely practicing under licensure from other states. Responses from these NPs in 2016 may be misclassified. Additionally, we did not directly measure individual NP autonomy preregulation and postregulation. Instead, we assumed that NPs in reduced or restricted practice facilities gained all aspects of FPA with respect to physician collaboration rather than maintaining the constraints of previous working relationships.

Reliance on the All Employee Survey, a voluntary survey, could lead to selection bias associated with survey responses. We do not know NP survey response rates by facility, and nonresponse from NPs experiencing greater burnout could underestimate burnout prevalence. However, previous research assessed the effect of survey nonresponse on facility-level burnout prevalence in the VHA and failed to find any bias (Simonetti et al., 2020). The minimum aggregation requirement of three NP survey respondents for inclusion of a facility-level burnout estimate may not have accurately estimated burnout at a facility. The aggregation requirement resulted in the inclusion of some facilities in one study year but not the other, potentially introducing bias. Also, longer follow-ups in measuring burnout may also be considered. We estimated burnout 1 year after the regulation change, though the effect of changing to FPA on burnout may vary over time.

Conclusion

NP practice policies affect the professional autonomy of NPs, which may be associated with NP burnout. The VHA-wide change to FPA for NPs did not significantly reduce burnout when measured at the facility level, though research at the individual NP or health care team level is needed. Findings in this study add to a broader body of research supporting NP FPA as overall advantageous for NPs, patients, and health systems. Burnout is costly for health care workers and health systems, and correlations between changes in NP practice policies and burnout deserve continued investigation in other health care settings.

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CRediT Statement

Allyson W. O'Connor: Conceptualization, Methodology, Formal analysis, Visualization, Writing - Original draft. *Christian D. Helfrich*: Conceptualization, Writing – Review and Editing, Supervision. *Karin M. Nelson*: Writing – Review and Editing. *Jeanne M. Sears*: Writing – Review and Editing. *Penny Kaye Jensen*: Writing – Review and Editing. *Christine Engstrom*: Writing – Review and Editing. *Edwin S. Wong*: Conceptualization, Writing – Review and Editing, Supervision, Funding acquisition.

Declaration of Competing Interest

The authors have no conflicts of interest to report.

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Ethical conduct of research

The VA Puget Sound (IIR 15-363, MIRB #01599) and the University of Washington Institutional Review Boards (IRB #STUDY00012372) approved this study.

Appendix

Table A1
Regression Estimates of the Proportion of Burnout Among NPs at Veterans Health Administration Facilities

	Base Model		Adjusted Model	
	Coefficient	[95% CI]	Coefficient	[95% CI]
Postperiod (2018 vs. 2016)	−0.07	[−0.21, 0.07]	−0.06	[−0.21, 0.08]
Intervention (Reduced or restricted vs. full practice authority)	−0.04	[−0.17, 0.10]	−0.03	[−0.17, 0.10]
Proportion of NPs with tenure < 5 years	-		−0.15	[−0.33, 0.03]
Proportion of NPs who were female	-		−0.15	[−0.37, 0.06]
Proportion of NPs under 50 years	-		0.04	[−0.13, 0.21]
DID estimate (Postperiod x intervention)	−0.05	[−0.20, 0.10]	−0.06	[−0.22, 0.09]
Constant	0.50	[0.38, 0.63]	0.68	[0.44, 0.92]

Note. CI, confidence interval; DID, difference-in-differences; NP, nurse practitioner.

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