Longitudinal Analyses of Pediatrician Burnout

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Abstract

Objective: Utilize the unique capabilities of a longitudinal design to 1) examine whether burnout is increasing over time among 2 cohorts of pediatricians, and 2) identify factors associated with decreased burnout.

Methods: Data from a national longitudinal study, the American Academy of Pediatrics Pediatrician Life and Career Experience Study, were used to examine self-reported burnout over a 5-year period (2012 to 2016) among 2002 to 2004 and 2009 to 2011 residency graduates (N = 1804). Study participation rates ranged from 94% in 2012 to 85% in 2016. Mixed-effects logistic regression for longitudinal analysis was used to examine burnout over time.

Results: In any given year, between 20% and 35% of study pediatricians reported that they were currently experiencing burnout. Significant increases in burnout over time were found for all participants combined and for each subgroup examined. Several factors were associated with reduced burnout. The largest associations with reduced burnout were found for increased flexibility in work schedule (adjusted odds ratio [aOR], 0.28; 95% confidence interval [CI], 0.22−0.35), decreased work busyness (aOR, 0.28; 95% CI, 0.22−0.36), or a job change (aOR, 0.48; 95% CI, 0.36−0.65).

Conclusions: Following 5 years of participation in a longitudinal study, more than 1 in 3 early- to mid-career pediatricians reported experiencing burnout. This represents a 75% relative increase in burnout from the start of the study. Specific characteristics of pediatricians' jobs, such as flexible work schedules and busyness of work settings, were most strongly associated with reduced burnout.

Keywords: burnout; longitudinal analyses; pediatric workforce; pediatrician wellness

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What's New

In a longitudinal analysis examining 5 years of data, early- to mid-career pediatricians increasingly reported experiencing burnout. Many work-related changes were associated with reduced burnout, including increased flexibility in work schedule, decreased busyness, job change, and increased time with patients.

Physician careers can be demanding. Training takes many years, it is common for physicians to work long hours, and the work itself can be high pressured and stressful. As a result of being in a healing profession, many physicians may also experience compassion fatigue.[1−4] Physician burnout, a syndrome characterized by emotional exhaustion, depersonalization, and a decreased sense of personal accomplishment,[5] has been the focus of many studies, with some estimating that as many as half of physicians may report being burned out at any given time.[6−12] Estimates of burnout for pediatricians have been slightly lower,[6,7] but there are indications that burnout among physicians overall is increasing.[7]

Several factors have been linked to burnout. Among all physicians, specialty,[7] early- and mid-career stage,[13] greater workload,[6,13,14] less control over schedule,[9] reduced autonomy,[15] and less social support among colleagues[14] are all factors found to be associated with burnout. Among a sample of early- and mid-career pediatricians, work factors such as less support from work colleagues, fewer resources for patient care, more years on the job, and hectic work settings, as well as personal factors such as sadness and depression, recent negative life events, and worse health, were all linked independently with burnout.[16]

A recent meta-analysis examined the success of interventions aimed at reducing burnout.[17] Among the most effective interventions were those directed at the organization, such as improved teamwork and communication and increased job control. Interventions that focused on the individual physician, such as mindfulness and self-care, generally were less effective. The review was limited, however, in that the authors did not specifically focus on pediatricians, the reviewed studies did not measure naturally occurring work and life changes, and the interventions were all part of smaller, local studies.[17]

To date, there have been no national longitudinal examinations of burnout among practicing pediatricians. The current study is a longitudinal study with several

design strengths that permit more nuanced examination of burnout compared to previous cross-sectional studies. First, the same group of pediatricians is tracked across multiple years; thus, trends in burnout can be examined for the individual without the concerns cross-sectional samples face regarding comparability. Second, the longitudinal design provides a longer catchment period, ranging back to 2012, to examine how pediatricians may have experienced burnout across 5 years. Third, the design incorporates time-varying explanatory variables and permits examination of whether changes in work and personal lives for pediatricians early in their careers are linked to higher or lower levels of burnout.[16] We also compared reported burnout with information on related topics such as career dissatisfaction and sadness or depression to provide context and to better understand the experience of pediatrician burnout.

METHODS

The American Academy of Pediatrics (AAP) Pediatrician Life and Career Experience Study (PLACES) was launched in 2012 to track the work and life experiences of pediatricians early in their careers using a national longitudinal design with 2 study cohorts (2002−2004 and 2009−2011 residency graduates).[18] PLACES participants are surveyed twice each year; a primary, longer survey covers several domains measured each year (eg, work characteristics, satisfaction, work-life balance, life experiences), and a shorter survey addresses topics of importance to participants. The AAP institutional review board reviewed and approved the PLACES project.

PARTICIPANTS

Participants were recruited in 2012 using an AAP database that includes all pediatricians who completed a US residency program, including both AAP members and non-members. Details regarding the PLACES methodology have been described previously.[18] All of the participants with the PLACES project (N = 1804) were included within the current analysis. Participation rates varied across survey years, from a high of 93% in 2012 and 2013 to 85% in 2016.

SURVEY CONTENT

The content domains and questions for the PLACES surveys were developed through 1) content prioritization by a project advisory committee; 2) literature review to identify related, existing questions; and 3) cognitive interviews and pilot tests to assess how questions were interpreted by participants. Where available, survey questions were adapted from other physician studies, including the Physician Worklife Study,[19,20] Medicine in Australia: Balancing Employment and Life,[21] and the AAP Annual Survey of Graduating Residents.[22]

ANALYTIC VARIABLES

All study data were self-reported. The main dependent variable was burnout.

BURNOUT

We primarily used a simple, single-item measure of burnout. The item stated, "I am experiencing burnout in my work." Responses were dichotomized as strongly agree or agree versus neither agree nor disagree, disagree, or strongly disagree. The item was adapted from previous work using a brief burnout measure.[10] For a subsample of 397 participants, we also administered the full Maslach Burnout Inventory (MBI)[23] in 2017 to provide a cross-check and to provide context for understanding participants' single-item report of experiencing burnout in their work. The MBI has 3 different dimensions of burnout: emotional exhaustion, depersonalization, and personal accomplishment. All are measured using the following frequency scale: 0 = never, 1 = a few times a year or less, 2 = once a month or less, 3 = a few times a month, 4 = once a week, 5 = a few times a week, and 6 = every day. We also asked the subsample to report their agreement about strategies that might help reduce physician burnout and enhance wellness.

DEMOGRAPHIC CHARACTERISTICS

We examined burnout for all PLACES participants in aggregate and by various demographic characteristics: PLACES cohort (2002−2004 or 2009−2011 residency graduates), gender (male or female), medical school location (United States/Canada or international), and subspecialty trained (subspecialty or no subspecialty). Respondents were included in the subspecialty group if they reported on any of the PLACES surveys that they completed or were in fellowship training. The demographic characteristics were treated as time-invariant variables within the longitudinal analyses.

TIME-VARYING EXPLANATORY VARIABLES

We examined 14 time-varying explanatory variables focused on pediatrician-reported work or life experiences that were selected based on previous research or the potential to be modifiable at the institution or individual level.[16,17] Each variable was collected at all survey years, and each variable measured a characteristic that could change from year to year. Thus, when each variable was examined across the 5-year study period, changes in the characteristics could be isolated and statistically examined. We dichotomized each variable at each time point to make the model results more comparable across variables. Several variables were dichotomized to strongly agree or agree versus neither agree nor disagree, disagree, or strongly disagree, including 1) flexibility in pediatricians' work schedule, 2) adequate time to spend with patients, 3) autonomy in their work, and 4) support from their physician colleagues. Other dichotomous work variables included 1) work hours < 50 hours versus 50 hours or more, 2) changed jobs in the past year (yes or no), and 3) how busy their work setting is (calm, somewhat calm, busy but reasonable vs chaotic, somewhat hectic, hectic). There were also many life-focused variables: 1) met federal guidelines for exercise (150 minutes moderate or 75 minutes vigorous; yes or no)[24]; 2) obtained 7 or more

hours sleep per night on average (yes or no); 3) moved to a new area (yes or no); 4) married or engaged (yes or no); 5) pregnant, had baby, or adopted (yes or no); 6) death of family member or close friend (yes or no); and 7) financial difficulties (yes or no). For the variables that were not direct indicators of whether a change had occurred in the past year, we created mean and deviation components to isolate the main effects and change effects. The time-varying explanatory variables were coded where possible so that the factors would have inverse relationships with burnout. For example, greater flexibility at work was coded with the higher value, so the relationship represented lower or decreased burnout and had an odds ratio (OR) less than 1.

Cumulative Variables

We also created a cumulative variable for burnout. This variable was set to "yes" if the participant strongly agreed or agreed that he or she was experiencing burnout in their work at any of the time points. To further place the cumulative burnout variable in context, we also computed cumulative variables for career dissatisfaction and for being often sad or depressed. Our goal was to explore the association between these conceptually related but different items. In response to the item, "All things considered, I am satisfied with my career as a physician," if the pediatrician disagreed or strongly disagreed at any time point, then the cumulative career dissatisfaction measure was set to "yes." If the pediatrician indicated that he or she was sad or depressed fairly or very often over the past year at any of the time points, then the cumulative sad or depressed variable was set to "yes."

Data Analysis

We used a 2-phase mixed-effects logistic regression for longitudinal analysis to examine burnout over time. This approach uses all available data, regardless of whether the pediatrician did not respond in all years and had some missing values. It accounts for the fact that the same individual is responding on multiple occasions and presents results as odds ratios (ORs) and 95% confidence intervals (CIs).[25]

In phase 1, we conducted mixed-effects regression with burnout as the dependent variable and with time as the lone explanatory variable for the full sample, and we repeated it for each of the time-invariant subgroup characteristics described above. In phase 2, we built a model with burnout as the dependent variable and then simultaneously tested the 14 time-varying explanatory variables to assess how changes in work or personal life might be linked to reduced burnout. This model also included the time-invariant subgroups.

For the time-varying variables, we tested both main effect and change components, except for the variables that directly indicated change, such as change in jobs, and where only the change component was interpretable. The main-effect component examined whether the average of the values in the explanatory variable across years is associated with burnout. Someone who, for example, reported a hectic work environment at multiple time points would have a higher average hectic value than someone who did not, and the model would examine if that higher average hectic value was associated with greater reported burnout. The change component, on the other hand, focused on the deviation from the individual's mean for the explanatory variable and examined its relationship to burnout. If someone had a hectic environment in 2012 but not in the other years, then the deviation would be large for 2012 and the model would test if the change toward a less hectic environment across years was associated with reduced burnout.

For time-invariant variables, we tested both baseline and slope components. For these variables, each individual had a baseline or intercept value for burnout, and then an individual slope for burnout was computed. The baselines and slopes were then aggregated and tested based on subgroups; for example, the values were aggregated for men and women, and the baselines and slopes were compared.

To further explore our variables, we conducted McNemar's tests to compare whether the percentages of cumulative burnout were higher or lower than the percentages for cumulative career dissatisfaction or being often sad or depressed. We conducted chi-square tests to examine the associations between the cumulative variables. We also conducted a subsample cross-check where we used independent group *t*-tests to compare the MBI mean values for pediatricians who did and did not report burnout using the cumulative burnout measure. For analyses, we used $P \leq .05$ as significant for all inferential tests and performed analyses in SPSS Statistics 24 (IBM, Chicago, Ill) and Stata 14 (Stata Corp, College Station, Tex).

Results

Data from all 1804 PLACES participants were included in the analyses. Participants were equally divided by cohort, with 50% in the 2002−2004 graduate cohort (n = 901) and 50% in the 2009−2011 graduate cohort (n = 903). The majority of participants were female (1316/1804, 73%). Nearly 9 in 10 (1567/1801, 87%) graduated from US medical schools, and 41% (745/1803) had received subspecialty training.

Burnout Over Time

In 2012, 20% of PLACES participants reported experiencing burnout (Table 1). The percent reporting burnout increased across survey years to a high of 35% in 2015 and 2016. The phase 1 mixed-effects logistic regression for all participants with time as the lone explanatory variable showed a statistically significant increase over time (OR, 1.35; 95% CI, 1.28−1.42), and increases were significant in all of the subgroups displayed in Table 1. The largest increases were found among females (OR, 1.42; 95% CI, 1.33−1.51), the 2002−2004 cohort (OR, 1.39; 95% CI, 1.29−1.50), and international medical graduates (OR, 1.38; 95% CI, 1.21−1.57).

Table 1. Burnout Over Time Overall and by Gender, Cohort, Medical School Location, and Subspecialty Training

	% Burnout						
	2012	2013	2014	2015	2016	Odds Ratio	95% Confidence Interval
Overall	20	28	30	35	35	1.35	1.28–1.42*
Gender							
Female	21	29	31	38	39	1.42	1.33–1.51*
Male	18	25	27	26	26	1.18	1.06–1.30*
Cohort							
2009–2011 cohort	19	26	27	33	34	1.32	1.23–1.42*
2002–2004 cohort	21	30	33	36	37	1.39	1.29–1.50*
Medical school location							
United States/Canada	21	28	30	35	36	1.35	1.27–1.42*
International	15	28	27	30	34	1.38	1.21–1.57*
Subspecialty training							
Subspecialty	20	26	29	34	34	1.35	1.25–1.46*
No subspecialty	20	29	30	35	36	1.35	1.26–1.45*

*$P < .05$.

Multivariable Regression Model

Table 2 presents the results of the phase 2 full mixed-effects logistic regression (n = 1754) that contains time-varying explanatory variables and time-invariant explanatory variables. The average number of observations per pediatrician was 4.1, resulting in 7155 total observations.

Time-Varying Explanatory Variables

In the full mixed-effects model (see Table 2), the factors with the strongest burnout reduction change effects have the lowest adjusted odds ratios (aORs) and are listed at the top of the table; those that increased burnout have higher aORs and are listed at the bottom. Across the variables, there was consistency in the main effects and change effects. For 10 of the 14 variables examined, statistically significant change effects were observed. Many of the strongest effects were for work setting variables. Increased flexibility of work schedules had the strongest association with reduced burnout (aOR, 0.28; 95% CI = 0.22–0.35), followed by decreased busyness (aOR, 0.28; 95% CI, 0.22–0.36), change in jobs (aOR, 0.48; 95% CI, 0.36–0.65), increased time to spend with patients (aOR, 0.59; 95% CI, 0.47–0.75), and increased autonomy (aOR, 0.62; 95% CI, 0.47–0.80). Among the life changes, increased sleep (aOR, 0.62; 95% CI, 0.48–0.80), increased exercise (aOR = 0.70; 95% CI, 0.54–0.89), and becoming pregnant or having a baby (aOR, 0.68; 95% CI, 0.53–0.88) were associated with reduced burnout, whereas experiencing the death of a family member or close friend (aOR, 1.37; 95% CI, 1.06–01.79) was associated with increased burnout.

Time-Invariant Explanatory Variables

The time-invariant variables were arranged from lowest to highest based on the slope effect. Gender was the only

Table 2. Factors Associated with Burnout

	Main Effect		Change Effect	
Pediatrician-Experienced Changes (Time Varying)	Adjusted Odds Ratio	95% Confidence Interval	Adjusted Odds Ratio	95% Confidence Interval
More/increased flexibility in work schedule	0.11	0.07–0.16*	0.28	0.22–0.35*
Less/decreased busyness in work setting	0.16	0.11–0.24*	0.28	0.22–0.36*
Change in jobs	NA	NA	0.48	0.36–0.65*
More/increased time to spend with patients	0.58	0.39–0.85*	0.59	0.47–0.75*
More/increased autonomy at work	0.60	0.37–0.98*	0.62	0.47–0.80*
More/increased sleep	0.62	0.43–0.88*	0.62	0.48–0.80*
Pregnant, had baby, or adopted	NA	NA	0.68	0.53–0.88*
More/increased support from colleagues	0.64	0.43–0.94*	0.68	0.54–0.87*
More/increased exercise	0.61	0.43–0.86*	0.70	0.54–0.89*
Fewer/decreased work hours	0.79	0.54–1.15	0.77	0.57–1.04
Moved to new area	NA	NA	0.79	0.58–1.08
Got married or engaged	NA	NA	0.96	0.60–1.54
Experienced death of family member or close friend	NA	NA	1.37	1.06–1.79*
Experienced financial difficulties	NA	NA	1.41	0.97–2.03
Demographic Characteristics (Time Invariant)	Baseline Difference		Slope	
Male gender	0.90	0.61–1.31	0.81	0.71–0.92*
2009–2011 cohort	0.78	0.56–1.09	0.95	0.85–1.07
Subspecialty trained	0.50	0.34–0.71*	1.07	0.95–1.21
International medical school graduate	0.49	0.29–0.82*	1.12	0.94–1.34

*$P < .05$.

factor to have a significant relationship with burnout. Males were found to have no baseline difference but less increase in burnout over time than females (slope effect: aOR, 0.81; 95% CI, 0.71−0.92). Lower levels of burnout were found at baseline for subspecialist-trained pediatricians (baseline effect: aOR, 0.50; 95% CI, 0.34−0.71) and for international medical graduates (baseline effect: aOR, 0.49; 95% CI, 0.29−0.82) in the full multivariable model, but no differences were found over time.

Cumulative Variables

The Figure presents each of the cumulative variables. Over half (58%) reported experiencing burnout at 1 measurement point, leaving 42% who never reported burnout. To help place the cumulative burnout percentage into context, this figure also displays the cumulative percentages for pediatricians reporting career dissatisfaction or for being fairly or very often sad or depressed. Far fewer pediatricians reported either career dissatisfaction (17%; $P < .001$) or being often sad or depressed (23%; $P < .001$) than burnout.

An association between burnout and career dissatisfaction was apparent. Twenty-six percent of those who reported burnout compared to 6% of those who did not report burnout also reported that they were dissatisfied with their careers at 1 of the 5 time points ($P < .001$). Thirty-four percent of those reporting burnout also reported that they were often sad or depressed, which is significantly higher than the 9% value for those not reporting burnout ($P < .001$). Even among those reporting burnout, three-fourths were satisfied with their careers and two-thirds were not often sad or depressed.

Subsample—Full MBI

An association was found between the cumulative burnout measure and all 3 of the MBI scales (emotional exhaustion, depersonalization, perceived low achievement). Pediatricians who reported burnout on the single-item measure at 1 or more time points were more likely than those who did not report any burnout to report more frequent emotional exhaustion (2.8 vs 2.0; $P < .001$) and depersonalization (1.4 vs 0.9; $P < .001$) and less frequent feelings of personal accomplishment (4.9 vs 5.2; $P < .001$). The mean value of 2.8 for emotional exhaustion indicates that the pediatrician felt emotionally exhausted between 1 and a few times a month on average. The mean value of 1.4 for depersonalization indicates that the pediatrician felt depersonalized a few times per year, but not every month, and the mean value of 4.9 for personal accomplishment indicates that the pediatrician experienced a feeling of personal accomplishment between 1 and a few times per week on average. Among those in the subsample who reported burnout at one or more time point, the most commonly reported strategies that they strongly agreed would help reduce burnout and enhance wellness were processes that reduce administrative tasks for physicians (73%), processes to improve workflow efficiency (61%), and reduced or flexible work schedules (56%).

Discussion

In a national longitudinal study, 35% of pediatricians reported experiencing burnout in 2016, and 58% experienced burnout at 1 or more time points over 5 years. Although the current study is generally consistent with other studies,[6,7] comparisons across studies are difficult due to the heterogeneity of burnout measures that have been used and inconsistent definitions.[11,26] Our results also demonstrated a relative increase in self-reported burnout of 75% over time for the sample overall, with percentages increasing from 20% to 35%. The largest gains occurred from 2012 to 2013 and from 2014 to 2015. The increases were apparent for all subgroups we examined, with some differences in the magnitude of the increases; thus, the trend appears to be reflective of influences impacting pediatrics and perhaps medicine generally. It is also possible that increased attention to burnout over this period allowed pediatricians to be more willing to admit experiencing burnout.

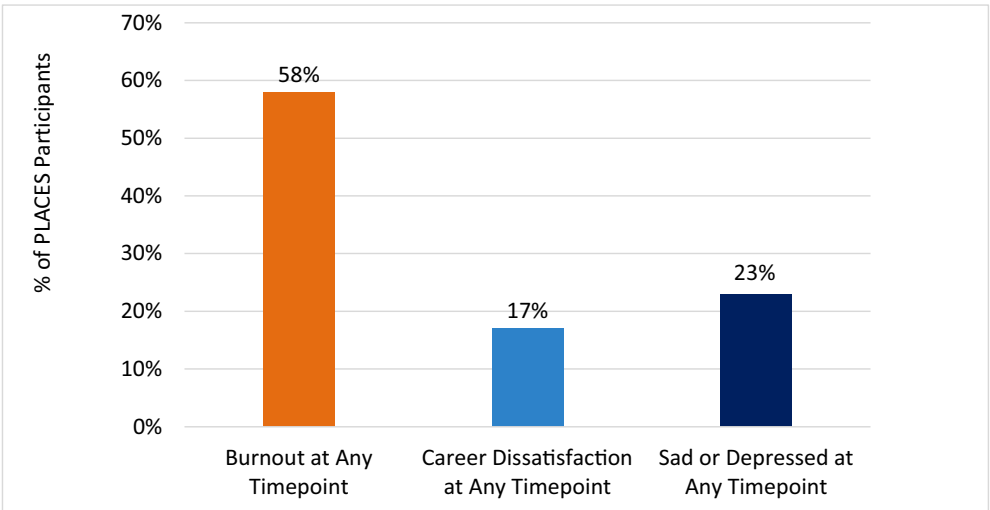

Figure. *Participants who reported burnout, career dissatisfaction, or being fairly or very often sad or depressed at 1 or more time points from 2012 to 2016.*

Many naturally occurring changes in pediatricians' work environments and lives were associated with reduced burnout over time. The strongest associations were for work-related characteristics, such as increased flexibility in work schedules, decreased busyness, change in jobs, increased time to spend with patients, and increased autonomy. Those experiencing burnout also reported that processes that reduce administrative tasks for physicians,[27] processes to improve workflow efficiency, and reduced or flexible work schedules would help reduce burnout. These are factors that employers and institutions could examine and try to address.[17] Individuals can also proactively try to make changes in these areas at their work settings, as well as in non-work-related areas such as sleep or exercise.

It is a concern, however, that even controlling for all the various work and life variables gender differences remained, with burnout being significantly more common among women.[7,12] This suggests that there are other important characteristics separating the experience of burnout for women and men that we were unable to control for within our model. Compensation, household responsibilities, work organizational structure, and willingness to report burnout are possible areas for which we did not have data for all survey years and thus could not include in the model.

Our results comparing burnout to job dissatisfaction and to being sad or depressed provide additional context for understanding pediatrician burnout, and we found similarities and differences between these factors. Those who reported job dissatisfaction and who reported being sad or depressed were more likely to report burnout, but, compared to burnout, far fewer pediatricians ever reported being dissatisfied with their careers or reported being often sad or depressed. Thus, burnout encompasses elements outside of job satisfaction and depression. It may be more related to exhaustion and more transient. It is concerning, however, that over one-fifth of pediatricians reported being sad or depressed fairly often or very often at some time point or another during the study time period.

Our study limitations included that results are limited to early and mid-career pediatricians, and we utilized a single item to measure burnout. There is inconsistency in the literature in the definition, measurement, and interpretation of burnout.[11,26] We did, however, conduct a cross-check using the full MBI, and all 3 MBI components were associated with the cumulative single-item measure. Although the participation rate among PLACES pediatricians who completed the 2012 to 2016 surveys was high, the initial project enrollment rate was lower at 41%.[18] Finally, there are other changes that pediatricians can make to reduce burnout that were not investigated, and we were unable to fully explore issues related to sadness and depression within this paper.

CONCLUSIONS

In summary, our study documented an increase in the percentage of early- to mid-career pediatricians experiencing burnout, with 35% reporting it in 2016 and 58% in any year. The increase was apparent in all subgroups examined and largest among women. Most pediatricians who reported burnout did not also report being dissatisfied with their career or being sad or depressed. Many structural work changes, such as more flexible work schedules and decreased busyness, were most strongly associated with reduced burnout. Our findings suggest that there are potential opportunities for employers and institutions to maintain and improve pediatrician wellness. It is children and their families, ultimately, who benefit from keeping pediatricians energized, mentally healthy, and committed to providing high-quality care for the children and families they serve.

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