Burnout and Disengagement in Pathology

A Prepandemic Survey of Pathologists and Laboratory Professionals

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• ***Context.***—**Despite widely prevalent burnout and attendant disengagement in medicine, the specific patterns and drivers within pathology and laboratory medicine are uncommonly studied.**

Objective.—**To assess the prevalence and drivers of burnout among pathology and laboratory medicine professionals, retrospectively, prior to the COVID-19 pandemic.**

Design.—**This was a cross-sectional, mixed-methods study engaging pathology and laboratory medicine professionals as subjects.**

Results.—**Of 2363 respondents, 438 identified as pathologists, 111 as pathology assistants, and 911 as pathology and laboratory professionals. The burnout rate was 58.4% (1380 of 2363) across all respondents in pathology and laboratory medicine. Burnout varied by job role ($P < .01$) and was highest among pathology and laboratory professionals. Disparities in burnout rate were observed by race. Fifty-six percent (1323 of 2363) of respondents felt that they had at least 1 symptom of burnout and were advancing toward a breaking point. Underlying factors ranked highly among all groups included control over workload and loss of meaning in work.**

Conclusions.—**Data provided from this cohort may help departments create successful strategies to reduce disengagement and burnout in the laboratory, especially during periods of increased stress as experienced during the COVID-19 pandemic. Further, these data may serve as a baseline comparison for future studies.**

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Burnout is a disease of civilization. It is a mental health syndrome defined by feelings of exhaustion, cynicism, and inefficacy due to a negative relationship with work and chronic job stress.[1] It has reached epidemic proportions in virtually all professions and is even included in the International Classification of Diseases (11th revision), although the World Health Organization clarified that burnout is an occupational phenomenon rather than a medical condition. Among health care professionals, burnout has increased at alarming rates in the last 2 decades and has been magnified during the last 2 years because of the stress and work pressures of the COVID-19 pandemic.[2–4] Burnout is associated with significant negative impacts on providers' health and well-being.[2,5,6] Over time, burnout leads to detachment from work—a lack of commitment, effort, and assiduousness toward work ("This is just a job.") Organizations experience increased costs from turnover, absenteeism, and medical errors. Burned-out colleagues undermine the organizational work climate with worker inefficiency, inefficacy, and disruptive behavior. Patients suffer the effects of low-quality care.[7]

The more commonly identified drivers for burnout among health care workers are increasing burden of work, loss of autonomy, and malalignment of goals and values with those of organizational leadership.[2,5,6,8,9] Among physicians, excessive administrative and data entry burdens with reduced patient time have also been found to be contributory.

Burnout has been only sparingly analyzed in the pathology and laboratory medicine health care workforce (PL-HCW), and primarily as part of larger health care professional groups.[8–12] Burnout among PL-HCWs has significant potential to affect the efficiency and quality of outcomes in health care; laboratory tests drive 70% of diagnoses, and in some cases 100% (eg, infections such as the current pandemic and cancer). In addition, as non–patient-facing health care workers (a primary career satisfaction domain for physicians[13]), the drivers of and interventions for burnout for PL-HCWs can reasonably be expected to be different from those of patient-facing physician/health care worker groups. Thus, understanding

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the drivers for burnout in PL-HCWs is essential as health care faces a workforce shortage of PL-HCWs at a time when they are very much needed.

The few data in the literature regarding burnout in PL-HCWs are worrisome. In 2011, for example, approximately 50% of pathologists reported experiencing burnout, a sudden 10% increase from previous reports.[2] Another study documented that more than 70% of pathologists have experienced burnout at some point, with approximately one-third of respondents experiencing it at the time of the survey.[11] This group reported the incidence of burnout in medical laboratory professionals (MLPs) at 85.3% during their career span, with nearly 50% reporting active burnout. This is the only group to have attempted to investigate specific drivers of burnout in the profession.[12]

Our study aimed to assess the prevalence of and identify the drivers for burnout among PL-HCWs using a mixed-methods approach in which both quantitative and qualitative data were collected.

METHODS

Design

This cross-sectional, mixed-methods, observational study used a validated survey to assess the prevalence of burnout and its drivers among PL-HCWs, categorized as pathologists, pathologists' assistants (PAs), and MLPs. MLPs were defined broadly as nonpathologist, non-PA professionals who fall into any of 13 different professional job description categories and work in pathology and laboratory medicine.[12] The questionnaire was prepared as a composite of the 10-question Mini Z Burnout Survey (a validated burnout survey used among health care professionals that evaluates the role of 7 workplace stressors) and 6 open-ended questions asking respondents to elaborate on experiences in their own words (word limit 250 words per question). The survey ended with 10 demographic questions. The Human Subjects Research Committee (Institutional Review Board) at Yale School of Medicine (New Haven, Connecticut) approved the project.

Measures

The 10-item Mini Z survey is validated against the Maslach Burnout Inventory, the established gold standard in evaluating medical burnout.[14] The Mini Z survey assesses single-item wellness measures of job satisfaction, job stress, and burnout as well as workplace stressors identified in prior seminal studies: workload control, work environment chaos, teamwork efficiency, alignment of values with department leaders, documentation time pressure, time spent on work at home, and electronic health record (EHR) proficiency. Respondents use their own definition of burnout to rate their level of symptoms on a 5-point Likert scale.[14] A single-item adaptation of this inventory has also demonstrated a good correlation with the Maslach Burnout Inventory.[15] The traditional Mini Z stressor of EHR proficiency was omitted in this study given the lack of relevance to specific pathology practices. Alphas for the individual items in relationship to burnout are higher than 0.7, with overall α being 0.8.

The survey incorporated 6 follow-up questions asking respondents to expand on their answers concerning burnout and joy in work to complement our understanding of the quantitative responses. A demographic section at the end of the survey collected information on age, gender, race, years or rank in practice or profession, and practice setting. For pathologists, the country of medical school (international medical graduate status [IMG] versus American medical graduate status) was also collected.

Participants

Eligible participants included pathologists, PAs, and MLPs (technologists of various types, members of the American Society for Clinical Pathology [ASCP]).[13] The survey was carried out using a Web-based, anonymous survey tool (Qualtrics; www.qualtrics.com). Professional pathology societies were petitioned to distribute the survey to their membership. The ASCP, the Association of Directors of Anatomic and Surgical Pathology (ADASP), and a PA Facebook group responded to our request and circulated the survey among their respective memberships, sans sponsorship of or contribution to the survey. Respondents were asked to snowball/disseminate the survey to their contacts using various social media platforms. Although this methodology potentially increased the size of the total respondent base, it limited our ability to accurately assess if the survey frame adequately represented the surveyed population, by limiting our ability to calculate the response rate and assess for nonresponse bias. In the setting of the survey being distributed to professional societies on a rolling basis, the survey was kept open for approximately 4 months in July through December of 2018. Other societies, including the College of American Pathologists, declined to send out the survey because of "survey overload." Participation was voluntary and without incentives. Participants could opt out of responding to any survey question, including demographic information. We did not exclude members of either society from repeat exposure to the study but requested that respondents not participate more than once.

Statistical Analysis

Associations between workplace stressors and demographic variables (age, gender, race, experience level, and practice setting) were evaluated using the χ^2 test for categorical variables. Given the broad racial distribution of respondents, race was dichotomized into white and nonwhite participants. To determine the association with burnout, multivariable logistic regressions were performed for each workplace stressor and experience with burnout outlined in the Mini Z. These models were adjusted for demographic variables and by type of practice for pathologists. The stressors and experiences with burnout were each ranked by strength of association with burnout. The analysis for this paper was generated using SAS software, Version 9.4 of the SAS System (2013, SAS Institute Inc, Cary, North Carolina).

Qualitative Analysis

Qualitative analysis was done by one individual (V.P.) trained in qualitative analysis. Inductively derived codes were eventually classified into 4 parent (group) codes identified from previous studies and known to exacerbate or ameliorate burnout: (1) workload factors (job demands, efficiency, resources, work control, and flexibility); (2) organizational culture, values, and social support at work; (3) meaning in work; and (4) work-life demands and integration.[9–11]

RESULTS

The demographics of respondents are presented in Table 1. A total of 2363 respondents were recorded, including 438 pathologists, 111 PAs, 911 MLPs, and 903 who responded "other" for job categorization (we did not probe this category further). Unsettlingly, 757 (84%) of individuals who self-identified as other did not respond to most of the demographic questions. Thus, the demographic-related assessments are limited to the remaining 3 groups. Physicians were the second-largest group to not respond to the demographic questions, with 86 (20%) not responding to the request for information on gender, 99 (22%) not reporting race, and 106 (25%) not reporting IMG or American medical graduate status.

Per our survey, pathology and laboratory medicine appeared to be a female-predominant profession, with 218 pathologists (61%), 90 PAs (81%), and 714 MLPs (79% per Table 1) being women. Eighty-five pathologists (25%) and

Table 1. Respondent Demographics by Type of Pathology Practice[a]

Demographic	Physicians, No. (%) (n = 438)	Pathologists' Assistants, No. (%) (n = 111)	Pathology Professionals, No. (%) (n = 911)	Other, No. (%) (n = 903)	Total, No. (%) (n = 2363)	P[b]
Gender						<.001
Male	124 (35.2)	20 (18.0)	169 (18.6)	21 (25.3)	334 (23.0)	
Female	218 (61.9)	90 (81.1)	714 (78.6)	57 (68.7)	1079 (74.2)	
Nonbinary	10 (2.8)	1 (0.9)	26 (2.9)	5 (6.0)	42 (2.9)	
Missing	86	0	2	820	908	
Race						<.001
White	254 (74.9)	90 (85.7)	756 (86.4)	68 (86.1)	1168 (83.5)	
Nonwhite	85 (25.1)	15 (14.3)	119 (13.6)	11 (13.9)	230 (16.5)	
Missing	99	6	36	824	965	
Age, y						<.001
20–29	2 (0.6)	24 (21.6)	81 (8.9)	4 (4.7)	111 (7.6)	
30–39	85 (24.2)	50 (45.1)	179 (19.7)	11 (12.8)	325 (22.3)	
40–49	107 (30.4)	23 (20.7)	157 (17.3)	26 (30.2)	313 (21.5)	
50–59	81 (23.0)	10 (9.0)	262 (28.9)	23 (26.7)	376 (25.8)	
60+	77 (21.9)	4 (3.6)	229 (25.2)	22 (25.6)	332 (22.8)	
Missing	86	0	3	817	906	
Experience level						<.001
Trainee/resident	11 (3.1)	1 (0.9)	6 (0.7)	0 (0)	18 (1.2)	
1–10 y	125 (35.5)	71 (64.0)	244 (27.0)	26 (31.3)	466 (32.1)	
11–20 y	88 (25.0)	24 (21.6)	153 (16.9)	16 (19.3)	281 (19.4)	
21–30 y	78 (22.2)	10 (9.0)	167 (18.5)	19 (22.9)	274 (18.9)	
>30 y	50 (14.2)	5 (4.5)	334 (37.0)	22 (26.5)	411 (28.3)	
Missing	86	0	7	820	913	
For physicians only						
Type of practice						
Academic	157 (44.9)					
Nonacademic	193 (55.1)					
Missing	88					
Location of training						
AMG	274 (82.5)					
IMG	58 (17.5)					
Missing	106					

Abbreviation: AMG, American medical graduate; IMG, international (ie, not US) medical graduate.

[a] Numbers may not sum to totals because of missing data, and column percentages may not sum to 100% because of rounding. Percentages in this table do not include missing data in the denominator (eg, % = demographic option/([total demographic − No. missing]).

[b] *P* value for χ^2 test (categorical variable).

134 PAs and MLPs (15%) identified as nonwhite. Four hundred ninety-one MLPs (54%), 158 pathologists (44%), and 14 PAs (13%) reported being older than 50 years; 229 MLPs (25%) and 86 pathologists (22%) reported being older than 60. With respect to medical training, 74 respondent pathologists (17.5%) were IMGs; however, 106 respondents (25%) did not answer this question.

Burnout Incidence Across Pathology and Laboratory Medicine

Our data identified a 58.4% (1380 of 2363) burnout rate across the PL-HCW. One hundred eighteen respondents (5%) felt completely burned out at the time of the survey, to the point of feeling that they needed to seek professional help; another 1323 respondents (56%) felt that they had at least 1 symptom of burnout and were advancing toward a breaking point. Rates of burnout were highest among MLPs, who showed 1.62 times odds of being burned out relative to pathologists (95% CI, 1.24–2.12 times).

White respondents had 1.74 times (95% CI, 1.29–2.33 times) the odds of burnout relative to nonwhites. Gender-nonbinary individuals had 2.30 times (95% CI, 1.05–5.03 times) the odds of burnout relative to males (Table 2). Our data did not reveal a statistically significant difference (using an α value of .05), in burnout among men and women, although there was trending to suggest that women perhaps felt higher levels of burnout ($P = .06$). However, a high nonresponse rate for race and gender may have skewed these results.

Stressors Weigh Differently Across Job Roles in Pathology

The hierarchy of contributors to burnout was different among the different professional groups of PL-HCWs (Table 3); the group "other" was excluded from this analysis, as it potentially represented a mixed group of individuals. A negative work atmosphere was the leading driver for burnout for the overall group, with 5.81 (95% CI, 4.54–7.44) times increased odds of burnout relative to those with

Table 2. Multivariable Logistic Regression Model of Factors Associated With Burnout				
Characteristic	**No.[a]**	**No. (%) With Burnout**	**Adjusted OR[b] (95% CI)**	***P***
Type of practice				
Pathology physicians	438	231 (52.7)	1.00	...
Pathologists' assistants	111	59 (53.2)	1.05 (0.67, 1.65)	.83
Pathology professionals	910	593 (65.2)	1.62 (1.24, 2.12)	<.001
Other	844	497 (58.9)	1.19 (0.72, 1.98)	.495
Gender				
Male	334	183 (54.8)	1.00	...
Female	1078	669 (62.1)	1.29 (0.99, 1.68)	.06
Nonbinary	42	30 (71.4)	2.30 (1.05, 5.03)	.04
Race				
Nonwhite	230	111 (48.3)	1.00	...
White	1168	730 (62.6)	1.74 (1.29, 2.33)	<.001

Abbreviation: OR, odds ratio.

[a] Numbers may not sum to total because of missing data.
[b] Also adjusted for demographics of gender, race, age, and experience level.

a positive work atmosphere and ranking among the top 2 drivers of burnout by all groups. Inadequate workload control was the second leading contributor to burnout, with 5.69 (95% CI, 4.47–7.24) times odds of burnout relative to those with adequate workload control and was ranked in the top 2 by 3 of 4 groups.

All PL-HCWs reported markedly increased odds of burnout with loss of job satisfaction and increased job stress. Job stress was associated with 9.3-fold (95% CI, 7.22–11.95-fold) odds of burnout, and loss of job satisfaction was associated with 8.5-fold (95% CI, 6.65–10.86-fold) odds of burnout. Pathologists and PAs listed loss of job satisfaction as a primary unpinning of experienced burnout, whereas MLPs listed job stress as primary (though specific factors of job stress were not necessarily disclosed outside of qualitative responses—see below).

Pathologists with low job satisfaction had 14-fold (95% CI, 8.49–24.57-fold) higher odds of burnout relative to those with optimal job satisfaction, and those with job stress had 11-fold (95% CI, 6.82–19.73-fold) higher odds of burnout relative to those without. Pathologists reported modest dissatisfaction on all measures of job satisfaction, ranging between 45.2% for value alignment with leaders and 68% for workload control. Female pathologists generally reported lower control over their workload (57.8% versus 68.1% for male pathologists, $P = .86$), lower sufficiency of time for documentation (45.5% versus 47.3% for male pathologists, $P = .36$), lower alignment of personal and administration/leaders' values (45.2% versus 54.8% for male pathologists, $P < .17$), and lower teamwork (46.3% versus 50.5% for males, $P = .25$). Compared with male pathologists, female pathologists were less likely to take work home (in the pre–novel SARS coronavirus era) (37.1% versus 53% for male pathologists, $P < .01$).

Table 3. Adjusted Associations Between Mini-Z Stressors and Burnout by Type of Practice and Strength of Association, Adjusted for Demographic Characteristics of Gender, Race, Age, and Experience Level				
	Pathology Physicians (OR [95% CI])	**Pathologists' Assistants (OR [95% CI])**	**Pathology Professionals (OR [95% CI])**	**Total (OR [95% CI])**
Mini-Z stressor rank				
1	Control over workload (6.80 [3.72, 9.71])	Time for documentation (8.09 [3.07, 21.27])	Work atmosphere (6.00 [1.39, 13.37])	Work atmosphere (5.81 [4.54, 7.44])
2	Work atmosphere (5.30 [3.27, 8.59])	Work atmosphere (5.03 [2.18, 11.60])	Control over workload (5.48 [4.01, 7.50])	Control over workload (5.69 [4.47, 7.24])
3	Time for documentation (4.09 [2.57,6.49])	Values aligned with leaders (4.03 [1.76, 9.25])	Time for documentation (4.94 [3.63, 6.72])	Time for documentation (5.01 [3.91, 6.41])
4	Teamwork (3.91 [2.20, 6.97])	Work time at home (3.39 [0.36, 31.62])	Teamwork (4.16 [2.86, 6.04])	Teamwork (4.13 [3.07, 5.55])
5	Values aligned with leaders (3.90 [2.48, 6.15])	Control over workload (3.33 [1.48, 7.48])	Values aligned with leaders (3.58 [2.66, 4.82])	Values aligned with leaders (3.76 [2.96, 4.77])
6	Work time at home (3.66 [2.21, 6.06])	Teamwork (3.11 [1.22, 7.93])	Work time at home (3.58 [2.04, 6.26])	Work time at home (2.95 [2.07, 4.21])
Mini-Z experiences with burnout				
1	Job satisfaction (14.44 [8.49, 24.57])	Job satisfaction (6.36 [2.66, 15.22])	Job stress (8.41 [6.13, 11.55])	Job stress (9.29 [7.22, 11.95])
2	Job stress (11.61 [6.82, 19.73])	Job stress (5.74 [2.31, 14.26])	Job satisfaction (7.05 [5.16, 9.62])	Job satisfaction (8.50 [6.65, 10.86])

Abbreviations: OR, odds ratio.

Table 4. Illustrative Narrative Descriptions of Contributors to Burnout Statements

Respondent	Illustrative Commentary
Workloads/staffing/lack of trained personnel/value of work	
Respondent A (MLP)	"The demands are overwhelming, which include compliance issues, documentation, schedules, supplies etc… I am also responsible for covering benches when we are short staffed AND EXPECTED to get all my work completed. Along with the PAMA cuts is an upper mgmt culture to expect more with less."
Respondent B (MLP)	"Always a shortage of lab techs. Feel guilty for not helping with extra shifts and difficulty in asking for days off…. Very discouraging… thinking about changing professions."
Respondent C (MLP)	"Lot of stress in my job due to insufficient staffing, unrealistic productivity standards, and increasing regulatory issues. I am ready to leave the field"
Respondent D (pathologist)	"Onerous CAP cancer templates and redundant 'signing' with e-sign of every lab procedure (100s) that we have no input or control over"
Respondent E (academic pathologist)	"My RVUs aren't enough. Not enough time for both clinical and academic work… a constant sense of inadequacy"
Respondent F (pathologist)	"Lab is chronically understaffed so slides come out whenever, there are always QA issues, pathologists do their own clerical work, using a tedious, crash-prone LIS. With so many NPs practicing, you get no clinical history… have to worry about the million ways your report will be misunderstood."
Work atmosphere/exposure to rude and aggressive behaviors	
Respondent G (MLP)	"Lab workers are consistently [bearing] the brunt of hostility from physicians and nursing staff. We are unsupported and unappreciated." "Always the lab's error if something wasn't collected correctly or ordered correctly by the Dr or RNs… demoralizing"
Respondent H (MLP)	"We are the lowest paid ancillary service department. My wife, a rad tech with the same number of years, she makes 10 dollars more an hour than I do and I'm maxed out! Pathologists don't care about the techs. We are trash."
Respondent I (pathologist assistant)	"I am a pathologist's assistant and we are NOT treated with respect by my pathologist and therefore [I] am not treated with respect by many of the hospital staff Dr or RNs."
Respondent J (pathologist)	"We have been made into technicians by other Dr[s] and now by our own pathology organizations. The 'joy' of practicing pathology… has been sucked out by the death eaters and Harry Potter has not left us the magic wand. We watch the technical staff treated as if they are workers at McDonald's. We have a Congress and executive branch who do not seem to understand science… so no realistic planning for the future or how medical care will be paid for exists. Pathology is the intersection of science and technology and the clinic but there does not seem to be good transference between… the pathologists have taken the invisibility potion."

Abbreviations: CAP, College of American Pathologists; Dr, physician; LIS, laboratory information system; mgmt, management; MLP, medical laboratory professional; NP, nurse practitioner; PAMA, Protecting Access to Medicare Act of 2014; QA, quality assurance; rad, radiology; RN, registered nurse; RVU, relative value unit; tech, technologist.

The Origins of and Possible Solutions to Relieve Burnout in Pathology and Laboratory Medicine

Nine hundred fifty-three respondents answered at least 1 qualitative question, with the highest number informing on drivers of stress (680 unique responses) and lowest on stories of disillusionment at work (201 unique responses). The descriptions of PL-HCW experiences offered insight into the specifics of workload burden and the sense of loss of meaning in work (Table 4). Increased workload was perceived by PL-HCWs as largely department- and institution-imposed; this sentiment was most pronounced for MLPs. All PL-HCWs reported high job demands, lack of resources, lack of control, and loss of autonomy at work; we believe this was likely the reason for the high rankings of job stress in the quantitative assessment. Additional factors contributing to job stress among MLPs included increased work hours with diminished schedule flexibility, increasing total number of shifts, and increased weekend and after-hours work shifts because of chronic understaffing.

Additional commonly reported stressors included unoptimized laboratory information systems and EHR interfaces with an inability to adapt to specialty laboratory work (eg, anatomic pathology), work imposed by upstream or higher-level clinical reorganization instituted without regard for the impact on the laboratory, and frequent need to expand offered test menus with novel and complex testing that required advanced training. These stressors were frequent contributors to chaos, lack of predictability, and error/oversight of information. Further, static systems with little ability to adapt to episodes of sudden unpredictable spikes in work needs (eg, sudden traumatic event, absence of a colleague) imposed additional challenges.

Among pathologists, anatomic pathology work was most challenging and was cited as creating both excessive data-entry work and work pressure. Cancer checklists were cited as burdensome and insufficiently specific, with too many negative and low-value elements. Some pathologists suggested that excessively long cancer checklists, combined with an increasing variety of health care providers with variable exposure to pathology education, contributed to an increased difficulty of understanding for clinicians and required more verbal discussions with clinicians to avoid misunderstanding. Academic pathologists appeared particularly aggrieved by increased patient-care work volume. It deprived them of time for valued academic and educational work, and in many cases, increased work did not offer sufficient monetary offset and was not given offset by parallel lower promotion requirements for institutional advancement.

Increased patient-care workload was coupled with increased demands for and reduced value of other categories of work, including quality maintenance and compliance work, education and training work (eg, residents, recruits, nurses), new institutional initiatives (eg, high-reliability training), and research. Among these categories, quality maintenance and compliance work were cited as the least valued and most burdensome, with departments/organizations not making sufficient allowances for this work to be completed.

Even though the primary workload factors were felt to be imposed by institutions, respondents across all PL-HCWs expressed angst at the increased work imposed by national and professional organizations in the form of ever-increasing and demanding regulatory and accreditation work, especially as this was made without recommendations for work limits.

Interestingly, job stress was consistently cited as a leading contributor to burnout among different categories of PL-HCWs for apparently differing reasons, revealed in the qualitative responses. Among supervisory positions, reduced reimbursement for pathology and laboratory work, understaffing, and inadequately qualified workforce with insufficient resources and support from institutional management seemed to be chronic stressors. Among MLPs, especially medical laboratory technicians, low pay and status relative to other similarly trained health care professionals was a commonly cited stressor, with some reporting inability to pay off educational loans. Pathologists expressed concern about lack of pathology fluency of a variety of clinicians, especially of allied health care professionals, and the risk for misunderstood results and attendant patient harm. Several shared episodes of incorrect diagnosis because of the upstream workflow changes (eg, transferring specimen requisition entry to nursing staff) or EHR features (eg, code-based history entry leading to misdiagnosis).

A major contributor to job stress for PL-HCWs was the frequent experience of disruptive behaviors from colleagues, both in and out of practice (Table 4). Extradepartmental abuse and bullying by clinicians (primarily experienced by pathologists) and nurses (primarily experienced by MLPs) were particularly severe in the setting of specimen quality and test utilization issues. Respondents voiced concern that institutional structures generally minimized complaints from pathology and laboratory medicine and did not empower PL-HCWs to report or respond to these behaviors. However, there were equally high numbers of reports of disruptive behaviors within teams/departments, both interprofessional and intraprofessional. Pathologists were felt to be dismissive of PAs and MLPs. Administrators/departmental leaders (both physician and nonphysician) were felt to be diminishing of non–leadership-role individuals. Many respondents reported exposure to episodes of bullying and yelling. Some reported sexual harassment and racially inappropriate comments.

These experiences were reported as deeply undermining of the very reasons that individuals chose a career in pathology and laboratory medicine. Stories addressing the choice of pathology and laboratory medicine recalled experiences of how the "lab result had made the correct diagnosis." Joy in work stories talked about "making" the call and/or "saving the day" in challenging cases, included collaborations with clinicians and researchers, and expressed the feeling of being valued by colleagues and leadership.

A loss of meaning in work from feeling undervalued emerged as a primary driver for disengagement, burnout, and withdrawal from the profession. The entire range of PL-HCWs expressed deep despondence at the status of the specialty in medicine and within their own institutions (Table 4). There was a broad perception that pathology and laboratory medicine as a field was disrespected, diminished, and treated as a technical, nonmedical profession. One particularly poignant story cited an instance where "the pathology department was 'forgotten' for 2 years in high-reliability training for the organization, till there was an error." Medical technologists voiced distress at being paid less than other similar professionals (eg, radiology technicians) despite equal years of training. PAs voiced distress at being paid less than physician assistants. MLPs voiced concern about the promotion of non–laboratory-trained professionals (eg, nursing administrators) to supervisory/managerial laboratory positions above them. Pathologists told stories of being diminished and dismissed as physicians.

All these factors had led several respondents to self-demote to lower-level roles, go part time, leave, or change professions. Respondents suggested that professional organizations needed to do more to showcase, support, and protect PL-HCWs in their workplaces and suggested that workload metrics such as the number of shifts, etc, be evaluated and considered as part of accreditation metrics much in the way that nurse to patient ratios are monitored in hospitals. Additional suggestions for professional pathology organizations included increasing periods between inspections, reducing regulatory burden, and not requiring signatures on every laboratory procedure.

DISCUSSION

Burnout has been broadly identified as undermining the safe and optimal functioning of health care organizations, and many studies have interrogated the drivers of burnout among health care professionals and physicians. However, the specific drivers for burnout among PL-HCWs are unclear, as these groups are generally dwarfed in larger health care worker and physician data sets. Considering the critical importance of laboratory professionals and pathologists to diagnosis—tests drive 70% of an individual patient's diagnosis, and diagnostic error has been heralded as a primary patient safety issue—it is essential to understand if the drivers for burnout for PL-HCWs are similar to those for patient-facing health professionals.[16]

Only 1 group to date has explored the drivers for burnout in PL-HCWs.[11,12] Garcia et al[11,12] examined job satisfaction, well-being, stressors, and burnout among both pathologists and MLPs prior to the COVID-19 global pandemic. Both studies document a relationship between job stress and burnout. These surveys reported 40% and 32.9% active burnout rates for MLPs and pathologists, respectively, with 80% and 72.9% of MLPs and pathologists, respectively, having experienced burnout at some point in their careers. Our study demonstrates a significantly higher active burnout rate among these groups (65% and 52.7%, respectively). These differences may be explained by both methodologic differences between studies and possible nonoverlapping respondent pools. Our study used the standard and validated mini-Z survey; Garcia et al[11,12] created a unique survey from evidence-based literature. We surveyed, in addition to ASCP, members of ADASP and

social media groups (specifically, a PA Facebook page) and asked respondents to snowball the survey. The ADASP membership is enriched for academic and anatomic pathologists, who may have formed a higher percentage of our respondent group. Our mixed-methods study provides somewhat deeper insights into the drivers of burnout in pathology and laboratory medicine.

Dissonance in Workload

PL-HCWs demonstrated marked workload dissonance: the exhaustion of energy for work, to the extent that recovery becomes impossible.[17] Increased volume, efficiency pressures, unanticipated surges in work, and unwieldy laboratory information systems not structured to readily adapt to new tests were the primary drivers for workload pressures in pathology and laboratory medicine. Work overload was perceived most by MLPs and least by pathologists. However, our qualitative analysis suggests that anatomic pathologists felt workload stress more severely, as was previously observed by Garcia et al.[11] This is not to say that anatomic pathology is more prone to burnout than any other field of medicine (though this would be an interesting hypothesis to be tested), rather to note that perhaps the variability in perceptions observed may vary according to the nature of the job: anatomic pathology is a less automated, more manual field, where pathologists (with ultimate signing authority) face great pressure for a "final diagnosis." Furthermore, there is greater unpredictability of workload volume, with as much as 3-fold variation from day to day or week to week.[18] Anatomic pathology needs more nimble processes that can adopt new workflows, rapidly train the workforce, and implement an increasing number of practice requirements, novel tests, and technology.[17] Data show these trends have led to a doubling of histologic slides generated for a given case, without a concurrent offset in valuation.[19]

Work Atmosphere and Job Satisfaction: The Significance of Departmental Culture

The practice of medicine requires both skill and an ability to perform under demanding and urgent situations. Various individual factors, including destressing at work, separating work from other aspects of life, wellness activities, and short respites, allow workers to rise to these challenging situations as needed without impacting their overall well-being or cumulative outlook of their work. However, especially in demanding and stressful conditions, work atmosphere—a feeling of belonging, appreciation, and reward for performance—is critical.

Similar to Garcia et al,[12] our data demonstrate that a poor work atmosphere is a particular contributor to burnout among PL-HCWs. Further, Rehder et al[20] identified MLPs as having the highest reports of experiences of disruptive behavior in health care. Specifically in our study, PL-HCWs reported experiences of disruptive behavior in both organizational and departmental domains. Extradepartmental experiences of bullying from clinicians were especially heightened in the setting of test quality and utilization reviews, as these contradict the traditional power hierarchy among specialties in medicine. Further, clinical providers may lose sight of value of the work performed by pathology professionals, given the separation from direct patient care. Plausibly, pathologists experience reduced burnout risk in comparison with MLPs because of the reduced distance from direct patient care of pathologists (they attend tumor boards and are more directly involved in patient care decisions). Hospital settings likely exacerbate these conflicts: hospitals are at higher risk for disruptive behavior.[21]

PL-HCWs also reported instances of intradepartmental interprofessional and intraprofessional incivility and disrespect. Pathology and laboratory medicine interprofessional hierarchies have not been well studied, and thus few, if any, interventions have been developed to address this issue (whereas much has been done to improve relationships in the physician-nurse hierarchy). Pathologists "must champion lab employees as assets to be protected,"[22] where they recognize the value of the work contributions of various laboratory professionals to achieving team goals and high-quality results. Pathologists as leaders of the diagnostic management team in the laboratory need to recognize improved relationships with their laboratory team members as key to achieving a culture that provides high-quality care/results. A sense of personal accomplishment is critical, in our view, to avoiding burnout.[23–25] That pathologists critically evaluate their responsibility in this domain is especially important as our field in general receives little to no direct feedback or gratitude from the patients for whom we provide care.

It is possible that roots of the reported interprofessional incivility and disrespect in pathology and laboratory medicine may lie in burnout itself, which is known to associate with increased incidence of disruptive behaviors. A recent study puts the field of pathology in the lowest quintile for resilience scores among medical subspecialties.[26] Whether the field of pathology self-selects for physicians with intrinsically lower resilience ability, or the pressures in the profession have deteriorated overall resilience, is unclear. What is well observed, however, is that burnout self-perpetuates and can be contagious within a department.

Two other observations deserve acknowledgment in our study. We did not observe increased burnout among women compared with men, although data trended in that direction. This is counter to the data in the broader literature, which shows higher rates of burnout among women.[27–29] This result may reflect selection bias in a cross-sectional study: if, for example, women have already left the profession because of burnout, the impact would be necessarily unrepresented in this study. Interestingly, the Garcia et al[11] study mirrors this result. Our study also showed a lower incidence of burnout among nonwhite PL-HCWs (including pathologists) and no difference in burnout among IMG pathologists, which is also perhaps counterintuitive. Although consistent with other reports,[30–32] this may also reflect selection bias and may relate to issues of structural and systemic biases in our society and organizations.[33] That a large percentage of respondents did not share gender or racial information raises serious concern for this possibility, as does the fact that our data has a high nonresponse rate for race and underrepresentation of IMGs in our respondent pool (the Association of American Medical Colleges reports 30.8% IMGs in pathology; our respondent pool had 17%).[34]

Reduction of Burnout and Disengagement: Possible Approaches

Perhaps the first step for pathology and laboratory medicine to combat burnout is to acknowledge the extent of the problem in the specialty. Our specialty shows some troubling signs, including ranking high in low-resiliency

measures and suicidality.[35] A multipronged approach with involvement at the policy, organizational, departmental/leadership, and individual levels is necessary to ensure the physical, financial, emotional, and social well-being of all workers.[36] For MLPs, flexible and creative strategies are urgently needed to reduce workload burdens, especially with ongoing and escalating workforce shortages—efficiency measures may need recalibrating to offset the strain; respondents suggested regulatory limits similar to those for trainees or nurses. Professional societies and regulatory bodies also need to identify and reduce low-value work and burdensome requirements.

Cancer/other checklists emerged as the possible parallel to EHRs for pathologists in our survey. Originally developed to remind the pathologist of essential assessment elements, checklists have ballooned to multipage documents that are difficult to see on a computer screen and for which data entry has dwarfed the communication function of the report. This in turn has seemingly added to the overall effort by increasing the need for additional communication, amendments, and perception of error. Reviewing the various strategies to mitigate and avoid burnout is beyond the scope of this paper, but among the more promising approaches is developing wellness-centered leadership models that treat individuals as persons rather than as interchangeable workers[37] and that allow for greater autonomy of physician decision-making.

Study Limitations

We permitted respondents to use their own definition of burnout, rather than attempting to solicit whether respondents met criteria per established scales[1,14]; this may have led to overestimation of burnout. The study is also limited by limited sample response rate and nonprobability sampling, which may impact the representativeness of the populations sampled.

Pre–COVID-19 Data

We note that these data were obtained in 2018, several months before the beginning of the SARS COVID-19 pandemic. In a sense, this gives us a glimpse of baseline data before the effects of the pandemic. We would hypothesize that the risk of burnout would be substantially increased if measured at the present date or during the midst of the pandemic, though this has not been specifically tested in this cohort.

CONCLUSIONS

Herein we have presented data aimed at describing burnout among PL-HCWs. A majority of respondents reported at least 1 symptom of burnout and were advancing toward a breaking point (pre–COVID-19 pandemic). Underlying factors ranked highly among all groups included work atmosphere and control over workload. Culture was a major contributing factor, one to which all pathology staff, as well as hospital administration and clinical staff, contributed. Future studies determining the rate of burnout in the post–COVID-19 pandemic era, as well as any change in contributing factors, would be of interest. Furthermore, pathology organizations, in addition to petitioning for the laboratory, need to develop mitigation efforts and interprofessional team steps specific to the field of pathology to improve work climate.

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References

1. Maslach C. Leiter MP. Understanding the burnout experience: recent research and its implications for psychiatry. *World Psychiatry*. 2016;15(2):103–111.

2. Fridner A, Belkic K, Minucci D, et al. Work environment and recent suicidal thoughts among male university hospital physicians in Sweden and Italy: the health and organization among university hospital physicians in Europe (HOUPE) study. *Gend Med*. 2011;8(4):269–279.

3. Koontalay A, Suksatan W, Prabsangob K, Sadang JM. Healthcare workers' burdens during the COVID-19 pandemic: a qualitative systematic review. *J Multidiscip Healthc*. 2021;27(14):3015–3025.

4. Prasad K, McLoughlin C, Stillman M, et al. Prevalence and correlates of stress and burnout among U.S. healthcare workers during the COVID-19 pandemic: a national cross-sectional survey study. *EClinicalMedicine*. 2021; 16(35):100879.

5. Shanafelt TD, Balch CM, Bechamps GJ, et al. Burnout and career satisfaction among American surgeons. *Ann Surg*. 2009;250(3):463–471.

6. Hewitt DB, Ellis RJ, Hu Y-Y, et al. Evaluating the association of multiple burnout definitions and thresholds with prevalence and outcomes. *JAMA Surg*. 2020;155(11):1043–1049.

7. Salyers MP, Bonfils KA, Luther L, et al. The relationship between professional burnout and quality and safety in healthcare: a meta-analysis. *J Gen Intern Med*. 2017;32(4):475–482.

8. Shanafelt TD, Noseworthy JH. Executive leadership and physician well-being: nine organizational strategies to promote engagement and reduce burnout. *Mayo Clin Proc*. 2017;92(1):129–146.

9. Dyrbye LN, Major-Elechi B, Thapa P, et al. Characterization of nonphysician health care workers' burnout and subsequent changes in work effort. *JAMA Netw Open*. 2021;4(8):e2121435.

10. Dyrbye LN, Major-Elechi B, Hays JT, Fraser CH, Buskirk SJ, West CP. Relationship between organizational leadership and health care employee burnout and satisfaction. *Mayo Clin Proc*. 2020;95(4):698–708.

11. Garcia E, Kundu I, Kelly M, Soles R, Mulder L, Talmon GA. The American Society for Clinical Pathology's job satisfaction, well-being and burnout survey of pathologists. *Am J Clin Pathol*. 2020;153(4):435–448.

12. Garcia E, Kundu I, Kelly M, Soles R, Mulder L, Talmon GA. The American Society for Clinical Pathology's job satisfaction, well-being and burnout survey of laboratory professionals. *Am J Clin Pathol*. 2020;153(4):470–486.

13. Friedberg MW, Chen PG, Van Busum KR, et al. Factors affecting physician professional satisfaction and their implications for patient care, health systems, and health policy. *Rand Health Q*. 2014;3(4):1.

14. Linzer M, Poplau S. Building a sustainable primary care workforce: where do we go from here? *J Am Board Fam Med*. 2017;30(2):127–129.

15. Rohland BM, Kruse GR, Rohrer JE. Validation of a single-item measure of burnout against the Maslach Burnout Inventory among physicians. *Stress Health*. 2004;20:75–79.

16. ECRI Institute. Top 10 patient safety concerns 2020. https://www.ecri.org/landing-top-10-patient-safety-concerns-2020. Accessed January 30, 2022.

17. Maslach C, Schaufeli WB, Leiter M. Job burnout. *Annu Rev Psychol*. 2001; 52:297–422.

18. Vanlandingham DM, Hampton W, Thompson KM, Badizadegan K. Modeling pathology workload and complexity to manage risks and improve patient quality and safety. *Risk Anal*. 2020;40(2):421–434.

19. Warth A, Stenzinger A, Andrulis M, et al. Individualized medicine and demographic change as determining workload factors in pathology: quo vadis? *Virchows Arch*. 2016;468(1):101–108.

20. Rehder KJ, Adair KC, Hadley A, et al. Associations between a new disruptive behaviors scale and teamwork, patient safety, work-life balance, burnout, and depression. *Jt Comm J Qual Patient Saf*. 2020;46(1):18–26.

21. Stecker M, Epstein N, Stecker MM. Analysis of inter-provider conflicts among healthcare providers. *Surg Neurol Int*. 2013;4(suppl 5):S375–S382.

22. Tulsi B. Taking care of business: the leadership challenges of running a successful lab. *Lab Manager*. 2019;14(1):10–15.

23. Cheung R, Yu B, Iordanous Y, Malvankar-Mehta MS. The prevalence of occupational burnout among ophthalmologists: a systematic review and meta-analysis. *Psychol Rep*. 2021;124(5):2139–2154.

24. Crane JM, Havercamp SM. Who thrives as a direct support professional?: personal motivation and resilience in direct support. *Res Dev Disabil*. 2020;106: 103764.

25. Solat S, Abrar M, Shabbir R, et al. Workplace interactional demands and work-family enrichment: an investigation from the service sector. *Front Psychol*. 11:1476.

26. West CP, Dyrbye LN, Sinsky C, et al. Resilience and burnout among physicians and the general us working population. *JAMA Netw Open*. 2020;3(7): e209385.

27. Templeton K, Bernstein CA, Sukhera J, et al. Gender-based differences in burnout: issues faced by women physicians. *NAM Perspectives*. https://nam.edu/wp-content/uploads/2019/05/Gender-Based-Differences-in-Burnout.pdf. Published May 28, 2019. Accessed January 29, 2022.

28. Kane L. "Death by 1000 cuts": Medscape national physician burnout & suicide report 2021. Medscape Web site. https://www.medscape.com/slideshow/2021-lifestyle-burnout-6013456. Published 2021. Accessed January 29, 2022.

29. Hillhouse JJ, Adler CM, Walters DN. A simple model of stress, burnout and symptomatology in medical residents: a longitudinal study. *Psychol Health Med*. 2000:5(1):63–73.

30. Garcia LC, Shanafelt TD, West CP, et al. Burnout, depression, career satisfaction, and work-life integration by physician race/ethnicity. *JAMA Netw Open*. 2020;3(8):e2012762.

31. St Onge JE, Allespach H, Diaz Y, et al. Burnout: exploring the differences between U.S. and international medical graduates. *BMC Med Educ*. 2022;22(1):69.

32. Afzal KI, Khan FM, Mulla Z, et al. Primary language and cultural background as factors in resident burnout in medical specialties: a study in a bilingual US city. *South Med J*. 2010;103(7):607–615.

33. Lawrence JA, Davis BA, Corbette T, et al. Racial/ethnic differences in burnout: a systematic review. *J Racial Ethnic Health Disparit*. 2022;9(1):257–269.

34. American Medical Association. Active physicians who are international medical graduates (IMGs) by specialty, 2019. https://www.aamc.org/data-reports/workforce/interactive-data/active-physicians-who-are-international-medical-graduates-imgs-specialty-2019. Accessed January 22, 2022.

35. Yasgur BS. A tragedy of the profession: Medscape physician suicide report 2022. Medscape Web site. https://www.medscape.com/slideshow/2022-physician-suicide-report-6014970#1. Accessed April 30, 2022.

36. Brady KJS, Ni P, Carlasare L, et al. Establishing crosswalks between common measures of burnout in US physicians. *J Gen Intern Med*. 2022;37(4):777–784.

37. Shanafelt T, Trockel M, Rodriguez A, Logan D. Wellness-centered leadership: equipping health care leaders to cultivate physician well-being and professional fulfillment. *Acad Med*. 2021;96(5):641–651.