Burnout, Resilience, and Mindfulness in Healthcare Workers in a Medically Underserved Region during the COVID-19 Pandemic

Binata Mukherjee, MBBS, MBA[1]; John F. Shelley-Tremblay, PhD[2]; William Henry Barber, MD, DPhil[1]; and Elly Trepman, MD[1]

Objectives: To evaluate employee burnout, work conditions, resilience, and mindfulness at an academic medical center in a US medically underserved region during the coronavirus disease 2019 pandemic.

Methods: We surveyed employees from August 7, 2020 to January 17, 2021. Respondents completed the Maslach Burnout Inventory (MBI), the Areas of Worklife Survey, the Connor-Davidson Resilience Scale, and the Philadelphia Mindfulness Scale (PHLMS) and answered a question about intention to stay in the present job until retirement. We performed exploratory stepwise logistic regression to evaluate associations between variables and intention to stay. We evaluated associations between variables with a structural equation model (SEM).

Results: The 655 respondents mostly were White women providers, aged 50 years and younger, who worked in inpatient wards, emergency departments, or intensive care units. Respondents had high mean MBI emotional exhaustion (35 ± 12) and moderate MBI depersonalization (12 ± 6), despite high MBI personal accomplishment (43 ± 8), middle-range Areas of Worklife Survey results, and middle to high Connor-Davidson Resilience Scale scores (29 ± 5), PHLMS awareness scores (37 ± 6), and PHLMS acceptance scores (30 ± 8). There were 408 respondents (62%) with MBI latent profiles consistent with being burned out, but 447 respondents (68%) were willing to stay in their present job. Older age was associated with intention to stay (coefficient 1.1 ± 0.1; $P < 0.001$). The latent variable burnout structural equation model (burnout-SEM) constructed from the MBI subscales inversely predicted intention to stay (coefficient − 0.33; $P < 0.001$), and this relationship was mediated by age.

Conclusions: Burnout was prevalent despite substantial personal accomplishment, resilience, and mindfulness.

Key Words: depersonalization, emotional exhaustion, intention to stay, personal accomplishment, resilience

In the United States, burnout affects more than 50% of physicians in some specialties and costs $4.6 billion annually from physician turnover and decreased clinical hours.[1,2] Burnout in healthcare workers may contribute to physical and emotional health problems, quitting clinical practice, and lower patient safety.[3–8]

Healthcare worker burnout may be caused by work-related stressors such as high workload, unrealistic expectations, and limited job control and autonomy.[9,10] Burnout also may be associated with perceptions of low reward for effort, limited organizational support, lack of supervisor and colleague fairness, and failure to contribute favorably to patient care.[9,11,12]

Protective factors may minimize burnout. Resilience (the ability to adapt and thrive under adverse and stressful conditions)[13] may be inversely associated with burnout symptoms in physicians.[14] Mindfulness, which includes awareness (monitoring the present experience) and acceptance (experiencing the present moment without avoidance),[15] may decrease healthcare worker burnout.[16] Job resources and work engagement also may protect against burnout development.[17] However, the efficacy of these factors in decreasing burnout may vary between individuals, and physicians may experience burnout despite high resilience.[14]

Key Points

- At an academic medical center in a US medically underserved region during the coronavirus disease 2019 pandemic, 408 of 655 surveyed employees (62%) had responses consistent with being burned out, but 447 employees (68%) were willing to stay in their present job.
- Burnout was prevalent despite substantial personal accomplishment, resilience, and mindfulness.
- Older age was associated with intention to stay (coefficient 1.1 ± 0.1; $P < 0.001$).

From the [1]Frederick P. Whiddon College of Medicine and the [2]College of Arts and Sciences, University of South Alabama, Mobile.

Correspondence to Dr Binata Mukherjee, Frederick P. Whiddon College of Medicine, University of South Alabama, CSAB 104, 5795 USA Drive North, Mobile, AL 36688. E-mail: bmukherjee@southalabama.edu.

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Healthcare workers have experienced a high prevalence of burnout during the coronavirus disease 2019 pandemic[18–20]—up to 76% of academic faculty.[21] Work stress and burnout may exacerbate health inequities by disproportionately affecting clinicians serving medically underserved communities with low resources.[22,23] Working in underserved areas was a risk factor for higher physician burnout before the pandemic,[24] but limited information is available about the effects of the pandemic on burnout in US medically underserved areas.[25]

We hypothesized that burnout may inversely predict intention to stay in the present job until retirement, but that burnout may be decreased by protective factors such as resilience and mindfulness. We assessed burnout at an academic medical center in a medically underserved southeastern US region during the pandemic and evaluated potential causes of burnout, associations between burnout, resilience, and mindfulness, and factors contributing to the intention to stay.

Methods

Participants

On August 7, 2020, we surveyed 2276 employees at all of the facilities of the University of South Alabama Health System and Colleges of Medicine and Nursing, including all of the physicians, nurses, and physician assistants in direct contact with patients and other faculty members involved in educating healthcare workers, students, and postgraduate trainees. We sent the survey to individuals listed in the institutional human resources database and accepted responses from August 7, 2020 to January 17, 2021. We sent three e-mail reminders and offered a university cafeteria meal voucher ($5) to the first 1000 respondents. Participants provided informed consent. The study was reviewed and exempted by the University of South Alabama institutional review board.

Survey

Most of the respondents completed the survey electronically (Qualtrics, Seattle, WA); replies were entered manually for six respondents who submitted paper forms. Respondents were allowed to skip questions. Survey items included demographics (age, sex, race), professional background (licensed healthcare qualification, departmental affiliation), and work activities. Self-reported work positions included providers (physicians, physician assistants, and nurse practitioners who performed patient care), nurses (frontline health care: registered, licensed practical, anesthetist, surgical, and midwife nurses), nonprovider faculty (nurse educators in teaching or other nonclinical roles who occasionally did minimal clinical work to maintain licensure), or staff (administration, billing, laboratory, and ward clerk workers). We grouped the self-reported work settings as inpatient (excluding intensive care unit), acute or critical care (emergency department or intensive care unit), outpatient clinic, or nonclinical (nursing education, administration, billing, or laboratory work).

Burnout

We estimated burnout using the 22-item Maslach Burnout Inventory (MBI) Human Services Survey for Medical Personnel, including two subscales that were risk factors for burnout (emotional exhaustion, nine items; depersonalization, 5 items) and one subscale that was protective against burnout (personal accomplishment, 8 items).[3] We scored MBI items on seven levels based on frequency (never, 0 points; daily, 6 points) and determined the three MBI subscales separately by adding item scores for emotional exhaustion (total: low, 0–16 points; moderate, 17–26 points; high, 27–54 points), depersonalization (total: low, 0–6 points; moderate, 7–12 points; high, 13–30 points), and personal accomplishment (total: low, 0–31 points; moderate, 32–38 points; high, 39–48 points). We categorized the three subscales into five MBI latent profiles described previously that were interpreted as consistent with the absence (engagement) or presence of burnout (burnout-profile, disengaged, ineffective, overextended).[26]

Work Conditions

We assessed work conditions using the 28-item Areas of Worklife Survey (AWS), grouped the responses into six subscales (workload, control, reward, community, fairness, values), scored the subscales as described previously (subscale range: minimum, 1; maximum, 5), and calculated the subscale averages.[9] A previous large normative sample showed the mean scores of all six subscales in the mid-range (workload, 3.0 ± 0.8; control, 3.3 ± 0.9; reward, 3.2 ± 0.9; community, 3.4 ± 0.8; fairness, 2.8 ± 0.8; values, 3.2 ± 0.8).[9]

Resilience, Mindfulness, and Intention to Stay

We assessed resilience using the 10-item Connor-Davidson Resilience Scale 10 (CD-RISC 10).[13] Respondents rated each item (5-point Likert scale: 0, not true to 4, mostly true), and we calculated the CD-RISC 10 score as the sum of all of the item scores (total: minimum, 0 points; maximum, 40 points).

We evaluated mindfulness using the 20-item Philadelphia Mindfulness Scale (PHLMS), which had two subscales (awareness, 10 items; acceptance, 10 items).[15] Respondents rated each PHLMS item (5-point Likert scale: 1, never to 5, very often). The awareness subscale score was the sum of the awareness subscale item scores (total: minimum, 10 points; maximum, 50 points), with higher total scores indicating greater awareness. We calculated the acceptance subscale score by reversing the acceptance subscale item scores and adding the reversed scores (total: minimum, 10 points; maximum, 50 points), with higher total scores indicating greater acceptance.[15] We assessed intention to stay in the health system using a single question ("Are you willing to continue in the present job until retirement?"); a positive response indicated intention to stay.

Structural Equation Model (SEM): Conceptual Framework for Burnout

We constructed an SEM as a causal network of risk and protective factors for burnout using assumptions, criteria, and model

specification, as described previously.[27] We included and estimated measurement error for the measured variables age; MBI, AWS, and PHLMS subscale scores; CD-RISC 10 score; and intention to stay. We used confirmatory factor analysis to construct two latent variables: workplace fit using the AWS subscales and burnout-SEM (distinct from the latent burnout-profile) using the MBI subscales. The relative weights of the AWS and MBI subscales in the latent variables were derived from the SEM procedure. We tested the latent variables in the model and calculated beta coefficients. We tested the conceptual model quantitatively using SEM software (SPSS Amos version 26, IBM SPSS Statistics, Armonk, NY) for exploratory and confirmatory factor analysis and assessed the model fit using metrics of fit including the comparative fit index (CFI), probability of close fit (PCLOSE), root mean square error of approximation (RMSEA), and standardized root mean square residual (SRMR).[28–30] Model fit was optimized by sequentially removing AWS workload, PHLMS awareness and acceptance, and CD-RISC 10; recalculating coefficients; and reassessing the metrics of fit as described previously.[28] Model fit was defined as excellent by CFI > 0.95, PCLOSE > 0.05, RMSEA < 0.06, and SRMR < 0.08 and acceptable by CFI > 0.90 and ≤ 0.95, PCLOSE > 0.01 and ≤ 0.05, RMSEA ≥ 0.06 and < 0.08, and SRMR ≥ 0.08 and < 0.1.

Outcomes

The primary study outcomes included burnout as estimated by MBI subscale scores and frequencies of MBI profiles (burnout-profile, disengaged, engagement, ineffective, overextended). The secondary outcomes included mean AWS subscale scores (workload, control, reward, community, fairness, values), resilience (mean CD-RISC 10 scores), mindfulness (mean PHLMS subscale scores for awareness and acceptance), and frequency of intention to stay.

Statistical Analysis

We used statistical software (SPSS version 27.0) and reported numeric data as no. (%) and averages as mean ± standard deviation. We tested variables for normality with the Shapiro-Wilk test. We transformed all of the outcome variables except intention to stay to normality with a two-step method described previously.[31] Missing data for MBI subscales, AWS subscales, CD-RISC 10, and PHLMS subscales were imputed by linear interpolation using the closest value before and after the missing value in the dataset. We estimated internal reliability of scores using the Cronbach α. We categorized the respondents into five age groups (30 years and younger, 31–40, 41–50, 51–60, and older than 60 years) and performed multivariate analysis of variance to evaluate associations between age, sex, race, work position, and work setting versus mean MBI subscale, CD-RISC 10, and PHLMS subscale scores. We used the χ^2 test to evaluate the association between MBI latent profiles versus age, sex, race, work position, work setting, and intention to stay. We performed exploratory stepwise logistic regression for the prediction of intention to stay from demographic and outcome variables, using forward conditional computation (a priori stepwise entry, 0.05; removal criterion, 0.1) and calculation of the Nagelkerke R^2. Significance was defined by $P \leq 0.05$.

Results

In 2276 individuals who were invited to participate, 850 individuals (37%) responded and completed all or part of the survey. We excluded 196 responses (23%) that had more than 10% data missing and included 655 responses (77%) in the analysis. Most of the included respondents were White women providers 50 years and younger who worked in inpatient wards, emergency departments, or intensive care units (Table 1).

Table 1. Demographic and employment characteristics of respondents to a survey about burnout in a medically underserved region[a]

Characteristic	Women	Men	Other sex	Total
No. responses	528 (81)	122 (19)	4 (1)	655[b] (100)
Age, y				
≤30	150 (23)	23 (4)	1 (0.2)	174 (27)
31–40	148 (23)	39 (6)	2 (0.3)	189 (29)
41–50	101 (15)	22 (3)	1 (0.2)	124 (19)
51–60	93 (14)	12 (2)	0 (0)	105 (16)
>60	36 (5)	26 (4)	0 (0)	62 (9)
Race				
White	431 (66)	102 (16)	2 (0.3)	535 (82)
Black	64 (10)	2 (0.3)	0 (0)	66 (10)
Asian	14 (2)	9 (1.4)	0 (0)	23 (4)
Hispanic	7 (1.1)	5 (0.8)	0 (0)	12 (2)
Other	12 (2)	4 (0.6)	2 (0.3)	18 (3)
Work position[c]				
Provider	380 (58)	113 (17)	3 (0.5)	496 (76)
Nurse	107 (16)	6 (0.9)	1 (0.2)	114 (17)
Nonprovider faculty	36 (5)	2 (0.3)	0 (0)	38 (6)
Staff	1 (0.2)	0 (0)	0 (0)	1 (0.2)
Not reported	4 (0.6)	1 (0.2)	0 (0)	6[b] (0.9)
Work setting[d]				
Inpatient	238 (36)	72 (11)	2 (0.3)	313[b] (48)
Acute or critical care	177 (27)	27 (4)	2 (0.3)	206 (31)
Outpatient clinic	65 (10)	9 (1)	0 (0)	74 (11)
Nonclinical	48 (7)	14 (2)	0 (0)	62 (9)

[a] *N = 655 responses. Time to complete survey, 15 ± 6 min.*

[b] *Including 1 response from an inpatient worker who did not report age, sex, race, and work position.*

[c] *Providers included physicians (medical doctor or doctor of osteopathy), physician assistants, and nurse practitioners who performed patient care and excluded nonprovider faculty or other staff. Nurses included all of the nurses in frontline health care, including registered, licensed practical, anesthetist, surgical, and midwife nurses. Nonprovider faculty included nurse educators with doctor of philosophy or doctor of nursing practice degrees in teaching or other nonclinical roles who occasionally did minimal clinical work to maintain nursing licensure. Staff included administration, billing, laboratory, and ward clerk workers.*

[d] *Inpatient, not including intensive care unit; acute or critical care, emergency department or intensive care unit; nonclinical, including nursing education, administration, billing, or laboratory work.*

Table 2. Burnout, resilience, and mindfulness in respondents to a survey about burnout in a medically underserved region[a]

	MBI[b]				PHLMS[g]	
Variable	Emotional exhaustion[c]	Depersonalization[d]	Personal accomplishment[e]	CD-RISC 10[f]	Awareness	Acceptance
All responses	35 ± 12	12 ± 6	43 ± 8	29 ± 5	37 ± 6	30 ± 8
Age, y						
≤30	38 ± 12	15 ± 6	41 ± 7	28 ± 6	37 ± 6	32 ± 8
31–40	38 ± 13	14 ± 6	43 ± 8	30 ± 5	37 ± 7	30 ± 7
41–50	35 ± 11	12 ± 6	43 ± 8	30 ± 5	37 ± 5	30 ± 7
51–60	31 ± 12	10 ± 5	43 ± 8	30 ± 5	35 ± 6	29 ± 8
>60	27 ± 12	9 ± 4	46 ± 9	31 ± 5	36 ± 8	26 ± 7
P	<0.001	<0.001	0.055	0.013	0.034	0.001
Sex						
Female	36 ± 12	12 ± 6	42 ± 8	29 ± 5	37 ± 6	31 ± 7
Male	32 ± 12	12 ± 7	45 ± 8	31 ± 4	36 ± 7	27 ± 8
Other	53 ± 9	26 ± 8	36 ± 4	26 ± 10	34 ± 7	31 ± 10
P	0.003	<0.001	0.062	0.26	0.17	0.001
Race						
White	36 ± 12	13 ± 6	43 ± 8	29 ± 5	36 ± 6	30 ± 8
Black	31 ± 12	10 ± 5	44 ± 8	31 ± 4	40 ± 6	31 ± 8
Asian	34 ± 14	12 ± 6	43 ± 8	28 ± 8	37 ± 6	31 ± 6
Hispanic	32 ± 13	11 ± 6	43 ± 7	29 ± 6	34 ± 5	28 ± 6
Other	35 ± 10	13 ± 9	45 ± 8	31 ± 6	37 ± 7	29 ± 7
P	0.14	0.018	0.37	0.087	0.003	0.47
Race by age, y[h]						
White						
≤30	38 ± 12	15 ± 6	40 ± 7	28 ± 5	36 ± 7	32 ± 8
31–40	38 ± 12	14 ± 6	43 ± 8	30 ± 5	37 ± 7	30 ± 8
41–50	35 ± 11	12 ± 5	44 ± 7	30 ± 5	37 ± 5	30 ± 7
51–60	33 ± 12	11 ± 5	43 ± 8	29 ± 5	35 ± 5	29 ± 8
>60	27 ± 12	9 ± 4	45 ± 9	31 ± 5	36 ± 8	26 ± 8
Black						
≤30	35 ± 9	9 ± 5	46 ± 6	33 ± 4	43 ± 4	35 ± 6
31–40	36 ± 15	12 ± 5	45 ± 8	31 ± 5	41 ± 4	31 ± 7
41–50	33 ± 10	12 ± 5	39 ± 10	30 ± 3	38 ± 6	32 ± 7
51–60	23 ± 9	7 ± 3	43 ± 9	31 ± 4	38 ± 7	29 ± 10
>60	25 ± 7	7 ± 3	47 ± 9	33 ± 4	39 ± 8	28 ± 3
P	0.038	0.001	0.37	0.005	0.001	0.23
Work position						
Provider	35 ± 14	13 ± 6	42 ± 9	30 ± 4	37 ± 7	31 ± 8
Nurse	32 ± 12	11 ± 6	43 ± 8	31 ± 4	37 ± 7	30 ± 8
Nonprovider faculty	36 ± 12	13 ± 6	43 ± 8	29 ± 5	36 ± 6	30 ± 8
Staff	24	5	37	37	31	32
Not reported	31 ± 17	9 ± 10	45 ± 8	36 ± 8	36 ± 7	33 ± 5
P	0.74	0.52	0.40	0.21	0.82	0.68

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Table 2. *(Continued)*

Variable	MBI[b]			CD-RISC 10[f]	PHLMS[g]	
	Emotional exhaustion[c]	Depersonalization[d]	Personal accomplishment[e]		Awareness	Acceptance
Work setting						
Inpatient	35 ± 13	12 ± 6	44 ± 8	29 ± 5	37 ± 7	30 ± 8
Acute or critical care	36 ± 11	13 ± 6	42 ± 7	29 ± 5	36 ± 6	30 ± 8
Outpatient clinic	35 ± 14	12 ± 6	44 ± 8	30 ± 5	37 ± 6	30 ± 7
Nonclinical	34 ± 13	11 ± 5	40 ± 9	31 ± 5	38 ± 5	30 ± 9
P	0.85	0.62	0.058	0.082	0.69	0.40

CD-RISC 10, Connor-Davidson Resilience Scale 10; MBI, Maslach Burnout Inventory; PHLMS, Philadelphia Mindfulness Scale; SD, standard deviation.

[a]*N = 655 responses. Data reported as mean ± SD.*

[b]*MBI subscale scoring: emotional exhaustion (total: low, 0–16 points; moderate, 17–26 points; high, 27–54 points), depersonalization (total: low, 0–6 points; moderate, 7–12 points; high, 13–30 points), and personal accomplishment (total: low, 0–31 points; moderate, 32–38 points; high, 39–48 points).*

[c]*Emotional exhaustion: low, 48 respondents (7%); moderate, 132 respondents (20%); high, 475 respondents (73%). Cronbach α, 0.92.*

[d]*Depersonalization: low, 130 respondents (20%); moderate, 231 respondents (35%); high, 294 respondents (45%). Cronbach α, 0.75.*

[e]*Personal accomplishment: low, 54 respondents (8%); moderate, 123 respondents (19%); high, 478 respondents (73%). Cronbach α, 0.78.*

[f]*CD-RISC 10: N = 653 because of 2 missing values. Scale range: minimum, 0 points; maximum, 40 points. Cronbach α, 0.89.*

[g]*PHLMS: N = 650 because of 5 missing values. Scale range, awareness: minimum, 10 points; maximum, 50 points; acceptance: minimum, 10 points; maximum, 50 points. Cronbach α: awareness, 0.82; acceptance, 0.89.*

[h]*Multivariate analysis of variance for White vs Black respondents in different age groups.*

Burnout and Work Conditions

The MBI subscales showed mean emotional exhaustion and depersonalization scores that were consistent with moderate and high levels of burnout, despite high mean personal accomplishment (Table 2). Most of the respondents had high emotional exhaustion, moderate or high depersonalization, and high personal accomplishment scores (Table 2). Younger respondents had significantly higher mean emotional exhaustion and depersonalization scores than older respondents, women had higher emotional exhaustion scores than men, and White respondents had higher emotional exhaustion and depersonalization scores than Black respondents in similar age groups (Table 2). MBI subscale scores were independent of work position or setting.

Most respondents had an MBI latent profile that was consistent with being burned out (ineffective, overextended, burnout-profile, or disengaged; total, 408 [62%]), including 343 White (64%) and 35 Black respondents (53%) (Table 3). The latent profiles of being burned out were directly associated with younger age and women versus men, but not race, work position, or work setting. The mean scores of all six AWS subscales were in the middle of the range (workload, 2.7 ± 0.9 [Cronbach α, 0.74]; control, 3.2 ± 0.9 [Cronbach α, 0.79]; reward, 3 ± 1 [Cronbach α, 0.88]; community, 3.7 ± 0.8 [Cronbach α, 0.85]; fairness, 2.7 ± 0.8 [Cronbach α, 0.84]; values, 3.4 ± 0.8 [Cronbach α, 0.74]), with the scores for community and values being above the 50th percentile.

Resilience, Mindfulness, and Intention to Stay

The mean CD-RISC 10 scores were lower in younger than in older respondents and in White than in Black respondents in similar age groups (Table 2). The mean PHLMS awareness and acceptance scores were lower in older than in younger respondents; the awareness score was lower in White than in Black respondents in similar age groups, and acceptance score was lower in men than in women (Table 2).

In the 655 respondents, 447 respondents (68%) were willing to stay and 202 respondents (31%) were not willing to stay in their present job until retirement, and there were five missing responses (0.01%) and one response with missing age. Intention to stay was similar between White (367 of 531 respondents [69%]) and Black respondents (49 of 65 respondents [75%]; $P = 0.30$). The MBI latent profile was significantly associated with intention to stay ($P < 0.001$). Logistic regression for intention to stay resulted in a 5-step model that explained 44% of the variance in the outcome (Nagelkerke $R^2 = 0.44$; $P < 0.001$) (Table 4). Intention to stay was significantly associated with older age (added to the model in step 1; $P < 0.001$), lower MBI emotional exhaustion (step 2; $P < 0.001$), higher AWS control (step 3; $P < 0.001$), lower MBI depersonalization (step 4; $P = 0.031$), and lower AWS workload (step 5; $P = 0.046$) but not race ($P = 0.68$). Older age was directly associated with intention to stay, and age alone predicted intention to stay with 77% accuracy. The addition of MBI and AWS subscales slightly but significantly increased the predictive strength of the model, with the final model having higher specificity (90%) than sensitivity (61%) or total predictive accuracy (81%). None of the protective factors (personal accomplishment, resilience, awareness, or acceptance) were associated with intention to stay or explained any unique variance in the model.

SEM

The initial SEM was designed to predict the latent variable burnout-SEM from workplace fit, taking into consideration all

Table 3. Latent profiles of respondents to a survey about burnout in a medically underserved region[a]

Characteristic	Total	Engagement	Ineffective	Overextended	Burnout-profile	Disengaged
No. responses (%)	655	247 (38)	183 (28)	150 (23)	65 (10)	10 (2)
Age, y						
≤30	174	43 (25)	56 (32)	36 (21)	35 (20)	4 (2)
31–40	189	71 (38)	39 (21)	54 (29)	22 (12)	3 (2)
41–50	124	44 (35)	37 (30)	36 (29)	6 (5)	1 (1)
51–60	105	50 (48)	35 (33)	16 (15)	2 (2)	2 (2)
>60	62	39 (63)	15 (24)	8 (13)	0 (0)	0 (0)
Sex						
Female	528	189 (36)	152 (29)	132 (25)	47 (9)	8 (2)
Male	122	58 (48)	30 (25)	17 (14)	15 (12)	2 (2)
Other	4	0 (0)	0 (0)	1 (25)	3 (75)	0 (0)
Race						
White	535	192 (36)	149 (28)	127 (24)	58 (11)	9 (2)
Black	66	31 (47)	19 (29)	15 (23)	0 (0)	1 (2)
Asian	23	8 (35)	8 (35)	4 (17)	3 (13)	0 (0)
Hispanic	12	4 (33)	4 (33)	3 (25)	1 (8)	0 (0)
Other	18	12 (67)	2 (11)	1 (6)	3 (17)	0 (0)
Work position						
Provider	496	177 (36)	137 (28)	119 (24)	55 (11)	8 (2)
Nurse	114	50 (44)	36 (32)	21 (18)	6 (5)	1 (1)
Nonprovider faculty	38	16 (42)	8 (21)	10 (26)	3 (8)	1 (3)
Staff	1	0 (0)	1 (100)	0 (0)	0 (0)	0 (0)
Not reported	6	4 (67)	1 (17)	0 (0)	1 (17)	0 (0)
Work setting						
Inpatient	313	128 (41)	81 (26)	66 (21)	32 (10)	6 (2)
Acute or critical care	206	67 (33)	64 (31)	49 (24)	24 (12)	2 (1)
Outpatient clinic	74	31 (42)	15 (20)	20 (27)	8 (11)	0 (0)
Nursing educator	62	21 (34)	23 (37)	15 (24)	1 (2)	2 (3)

[a]*N = 655 responses. Data reported as number of responses (% of row total). Age, sex, race, and work position were not reported by 1 respondent who had an ineffective profile. The latent profiles of being burned out (ineffective, overextended, burnout-profile, and disengaged) were directly associated with younger age (P < 0.001) and women vs men (P < 0.001) but not race (P = 0.21), work position (P = 0.77), or work setting (P = 0.16).*

six AWS subscales and the mediating effects of CD-RISC 10 and PHLMS awareness and acceptance, and to predict intention to stay from burnout-SEM. The initial model yielded unacceptable fit (CFI 0.86). After sequentially removing AWS workload, CD-RISC 10, and PHLMS awareness and acceptance, the maximum model fit was achieved with excellent CFI (0.96), PCLOSE (0.064), and SRMR (0.046) and acceptable RMSEA (0.061). In the final model, emotional exhaustion was associated directly with personal accomplishment, workplace fit inversely predicted burnout-SEM, burnout-SEM inversely predicted age and intention to stay, and age directly predicted intention to stay (Fig.). Age mediated the relationship between burnout-SEM and intention to stay.

Discussion

The present results showed that younger employees had a higher risk of developing burnout and lower intention to stay in their present job than did older employees, which was consistent with previous findings in healthcare workers during new viral outbreaks and in academic physicians.[32,33] Black respondents had measures consistent with lower depersonalization and higher resilience and awareness than did White respondents. The SEM suggested that level of burnout may predict 33% of the variance in intention to stay, but workload and personal mediating factors such as resilience and mindfulness did not affect burnout or intention to stay. The finding that workplace fit, based on control, reward, community, fairness, and values, may predict burnout is consistent with previous studies, suggesting that causes of employee distress and burnout may be multifactorial, including individual and institutional factors.[5,25]

A strength of our study was the inclusion of survey tools for burnout, resilience, mindfulness, and intention to stay, enabling the evaluation of interactions of multiple variables. Previous studies that measured only emotional exhaustion and depersonalization indicated that these variables may be sufficient and useful in quantifying burnout and decreasing survey length.[1,34]

Table 4. Logistic regression for the association between risk and protective factors for being burned out vs intention to stay in the present job until retirement[a]

Step no.	Variables	Coefficient ± SE[b]	*P*	2 × 2 Table: Staying (response)[c]	Staying (model prediction): Yes	Staying (model prediction): No	Correct, %
1	Age	1.1 ± 0.1	<0.001	Yes	386	61	86
				No	91	111	55
				Overall %			77
1	Age	1.1 ± 0.1	<0.001	Yes	388	59	87
2	MBI, emotional exhaustion	−0.06 ± 0.01	<0.001	No	84	118	58
				Overall %			78
1	Age	1.1 ± 0.1	<0.001	Yes	395	52	88
2	MBI, emotional exhaustion	−0.05 ± 0.01	<0.001	No	76	126	62
3	AWS, control	0.5 ± 0.1	<0.001	Overall %			80
1	Age	1.0 ± 0.1	<0.001	Yes	401	46	90
2	MBI, emotional exhaustion	−0.03 ± 0.01	0.011	No	79	123	61
3	AWS, control	0.5 ± 0.1	<0.001	Overall %			81
4	MBI, depersonalization	−0.05 ± 0.02	0.031				
1	Age	1.0 ± 0.1	<0.001	Yes	401	46	90
2	MBI, emotional exhaustion	−0.03 ± 0.01	0.044	No	78	124	61
3	AWS, control	0.5 ± 0.1	<0.001	Overall %			81
4	MBI, depersonalization	−0.05 ± 0.02	0.043				
5	AWS, workload	−0.5 ± 0.3	0.046				

AWS, Areas of Worklife Survey; MBI, Maslach Burnout Inventory; SE, standard error.

[a]*N = 649 respondents after exclusion of 5 missing responses to the question about intention to stay and 1 response with missing age. Data reported as coefficient ± standard error, number, or %. Logistic regression: 5-step model with additional variables added at each step.*

[b]*Odds ratios (95% confidence intervals): age, 3.0 (2.5–3.7); MBI, emotional exhaustion, 0.94 (0.92–0.96); AWS, control, 1.7 (1.3–2.2); MBI, depersonalization, 0.95 (0.91–1.0); AWS, workload, 0.60 (0.36–0.99).*

[c]*Staying, response to survey question: "Are you willing to continue in the present job until retirement?"*

Measuring burnout with a yes-or-no answer to MBI emotional exhaustion and depersonalization or other single-item measures based on the MBI may limit survey length but precludes the profiling of respondents on a continuum of burnout[35–37] that may provide actionable information, such as whether employees feel overworked but still engaged.[26] The frequency of responses was in the range observed for similar surveys despite our survey length with multiple items.[38]

We observed a large prevalence of high emotional exhaustion (73% of respondents) (Table 2), similar to the high frequency of burnout in physicians in other regions from March to June 2020 (67%)[39] and December 2021 to January 2022 (62.8%).[20] Lower frequencies of burnout were observed before the pandemic in physicians at a tertiary care academic practice in Boston, Massachusetts (45.6%),[33] US national surveys of physicians (43.9%–45.8%),[35,37] and smaller US primary care practices (25.1%).[36] We observed higher mean emotional exhaustion and depersonalization scores (Table 2) than were observed before the pandemic in medical and mental health professionals (emotional exhaustion, 16.89–22.19; depersonalization, 5.72–7.12)[3] and US physicians (emotional exhaustion, 23.2; depersonalization, 6.8).[37]

The high personal accomplishment scores (mean and frequency) observed despite high emotional exhaustion and depersonalization are evidence of strong employee pride in our institutional mission,[40] evidenced by high scores for AWS community and values. In contrast with the direct relationship observed between emotional exhaustion and personal accomplishment (Fig.), personal accomplishment in emergency workers in Italy during the pandemic was associated inversely with emotional exhaustion and depersonalization but directly with high hardiness (dispositional resilience), consistent with the robust CD-RISC 10 scores for resilience observed in our respondents.[41] Resilience measured by CD-RISC 10 was inversely associated with burnout in US physicians before the pandemic,[14] but it was not predictive of burnout in our study, possibly because of differences between study populations, settings, survey tools for resilience, or study timing.[14,42]

We observed slightly lower mean depersonalization and higher CD-RISC 10 and PHLMS awareness scores in Black respondents than in Whites despite similar intention to stay, but we did not query health status or experiences with social discrimination. A previous national survey of physicians also showed a lower odds of burnout in Black, Hispanic, and Asian versus White

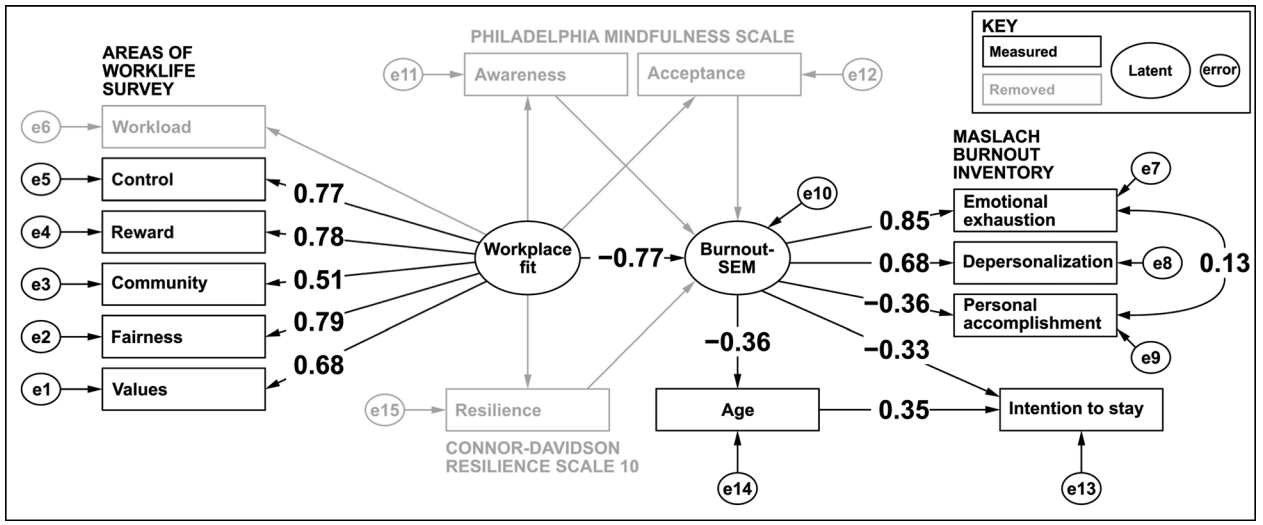

Fig. Structural equation model (SEM) of risk and protective factors for healthcare employee burnout and intention to stay in the present job until retirement in a survey in a medically underserved region, 2020–2021. Measured variables are shown in rectangles,[3,9,13,15] errors in small ovals (e1–e15), and latent variables in large ovals; measured variables that were tested initially and removed to optimize model fit are shown in gray. The latent variable workplace fit was constructed using the Areas of Worklife Survey subscales; burnout-SEM was constructed using the Maslach Burnout Inventory subscales. Beta coefficients shown on the path arrows were significant ($P < 0.001$). In the final model, emotional exhaustion was associated directly with personal accomplishment (coefficient, 0.13; $P < 0.001$), workplace fit inversely predicted burnout-SEM (−0.77; $P < 0.001$), burnout-SEM inversely predicted age (−0.36; $P < 0.001$) and intention to stay (−0.33; $P < 0.001$), and age directly predicted intention to stay (0.35; $P < 0.001$). Age mediated the relationship between burnout-SEM and intention to stay (−0.12; $P < 0.001$).

physicians.[43] Further study is justified to evaluate associations among burnout, resilience, social discrimination, coping mechanisms, and physical and psychological health.[44]

Healthcare professionals working in rural and medically underserved regions may experience high levels of stress and burnout because of the lack of resources needed to provide care.[23] Unmet social needs of urban underserved patients may exacerbate physician emotional exhaustion and burnout.[45] However, family practitioners in rural towns of fewer than 10,000 people have less than half the frequency of burnout than practitioners in cities (25% vs 51.4%).[46] We observed substantially higher levels of employee burnout during the pandemic (Table 2) compared with primary care physicians at Federally Qualified Health Centers before the pandemic (21.6%).[36]

The limitations of the present study include limited generalizability because it was performed in a single academic medical center. Selection bias may have occurred with employees wanting to report burnout or against employees experiencing emotional exhaustion and survey fatigue. The question about intention to stay was ambiguous because the phrase "in the present job" did not distinguish between employer or profession,[47,48] and the question had unknown validity and reliability because it was not validated. As no prepandemic institutional data were available, we were unable to quantify the effect of the pandemic on burnout, resilience, mindfulness, and intention to stay.

Conclusions

We observed a high prevalence of burnout despite substantial levels of personal accomplishment, resilience, and mindfulness. Emotional exhaustion was associated directly with personal accomplishment. Workplace fit inversely predicted burnout. Burnout inversely predicted intention to stay in the present job, and this relationship was mediated by age.

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