Original Research

AMERICAN ACADEMY OF OTOLARYNGOLOGY–HEAD AND NECK SURGERY FOUNDATION

OTO Open
2022, Vol. 6(2) 1–10

DOI: 10.1177/2473974X221100547
http://oto-open.org
SAGE

Predictors of Professional Fulfillment and Burnout Among Otolaryngologists During the COVID-19 Pandemic

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Abstract

Objective. The goal of this study is to assess burnout and professional fulfillment during the initial weeks of the COVID-19 pandemic among otolaryngology practitioners.

Study Design. Cross-sectional survey.

Setting. International survey of otolaryngologists during a pandemic.

Methods. A cross-sectional survey was performed from April 24 to May 8, 2020, via email and social media platforms to understand the impact of the COVID-19 pandemic on otolaryngology practitioners in academic and private practice. The Professional Fulfillment Index was used to assess professional fulfillment and burnout. Burnout was divided into work exhaustion and interpersonal disengagement.

Results. Of 243 respondents, 202 completed the Professional Fulfillment Index portion of the survey. An average score $\geq$3 on the professional fulfillment section correlates with fulfillment, while an average score $\geq$1.33 on the burnout section correlates with burnout. The average score of professional fulfillment was 2.17, with 85.6% of respondents reporting lack of professional fulfillment. The average score on burnout was 1, with 40.1% of otolaryngologists reporting burnout. In multivariable analyses, females were found to have statistically lower professional fulfillment (beta = -2.28, $P = .010$) with higher rates of work exhaustion (beta = 0.62, $P < .001$), interpersonal disengagement (beta = 2.08, $P = .023$), and burnout (beta = 4.49, $P = .002$).

Conclusion. Early in the COVID-19 pandemic, most participants reported a lack of professional fulfillment while just under half experienced burnout. Female gender was associated with low professional fulfillment and high work exhaustion, interpersonal disengagement, and burnout. Attention to burnout and job satisfaction during a pandemic is critical for the appropriate well-being of otolaryngology practitioners.

Keywords

COVID-19, SARS-CoV-2, novel coronavirus, burnout, well-being

Received April 4, 2022; accepted April 21, 2022.

Coronavirus disease 2019 (COVID-19), caused by severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2), was first recognized in Wuhan in the Hubei province of China at the end of 2019.[1] COVID-19 subsequently spread around the world with dramatic increases in case numbers and deaths. The primary mechanism of transmission is believed to be predominantly through respiratory droplets, and the virus can be spread by asymptomatic, presymptomatic, or symptomatic patients with a viral load peak early in the disease process.[2-5] This has led to sustained and efficient human transmission, especially in areas in which people live in close proximity. COVID-19 was officially deemed a pandemic by the World Health Organization on March 11, 2020.[6] COVID-19 has had dramatic impacts on the economy, social freedom, educational opportunities, and access to health care. Health care workers have faced all these challenges in addition to a higher risk of COVID-19 transmission, a dramatic alteration in practice patterns, and shifts in patient management paradigms during the COVID-19 pandemic. Otolaryngologists are experiencing a unique set of challenges during this time, and close attention to the professional fulfillment (PF) and burnout being experienced during this time is critical.

The viral load of COVID-19 is high in the oropharynx and nasopharynx of patients with active infection.[2,7] Importantly, the viral load has been shown to be similar between symptomatic and asymptomatic patients, leading to the potential risk of transmission from a patient who is unaware of one's own

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This article was presented at 2021 AAO-HNSF Annual Meeting & OTO Experience; October 4, 2021; Los Angeles, California.

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infection.[8] With this in mind, otolaryngologists working regularly in and around the mucosa of the upper aerodigestive tract are at particularly high risk of exposure. Reports from the initial outbreak in Wuhan noted that otolaryngologists were becoming infected and dying at a higher rate than most other specialties of medicine.[9] The first reported death of a physician in China was that of an otolaryngologist from Wuhan.[10] Otolaryngologists now have constant concerns regarding the potential risk of exposure during a significant portion of clinic visits and operations. Early in the pandemic, there were also concerns for the availability of diagnostic testing and personal protective equipment, which led to increased concern for the safety of themselves and those around them. Additionally, concern for practice productivity and viability has become a more prominent issue for many physicians. This mental tax in addition to the baseline concerns faced by otolaryngology providers could influence burnout and PF among this group. It is critical to evaluate these indices to implement initiatives to minimize associated negative outcomes.

Risk for burnout among physicians was evaluated and reported well before the introduction of the COVID-19 pandemic.[11,12] Physicians in general face a high rate of burnout due to a myriad of complex reasons. In a study conducted prior to the pandemic, burnout had been shown to be prevalent among academic otolaryngologists in the United States.[13] It stands to reason that the introduction of this novel virus with its far-reaching impacts could alter burnout levels among providers.

The goal of this study is to evaluate the impact of the COVID-19 pandemic on burnout and PF in this group by quantifying their magnitude with a validated scale: the Professional Fulfillment Index (PFI).[14] Additionally this study will aim to identify differences in these factors between groups of otolaryngology providers.

Methods

Study Design

A survey aimed at collecting information regarding burnout among otolaryngologists during the COVID-19 pandemic was programmed in the SurveyMonkey platform (SurveyMonkey Inc). Survey data were collected during the COVID-19 pandemic between April 24 and May 8, 2020. The survey collected cross-sectional data on general demographics as well as information specific to COVID-19 to create comparison groups. All data collected from the survey are reported in the tables. A validated burnout instrument, the PFI, was utilized and served as the outcome data.[14] The PFI has 3 subscales, which measure PF, work exhaustion (WE), and interpersonal disengagement (IPD). Each item in the questionnaire is scored on a scale from 0 to 4. Scores for each subscale are then averaged. Higher scores on PF are favorable, with $\geq$3.00 representing fulfillment. The WE and IPD subscales are combined to achieve an overall burnout score, with scores $\geq$1.33 representing burnout.

Subjects completed the survey online through SurveyMonkey, which utilizes SSL encryption (secure sockets layer) over an https link for additional security during data transfer. All data were deidentified and untraceable from the moment of collection. Informed consent was built into the survey, and if declined, the survey was terminated immediately. Expedited approval for the study was obtained from the Institutional Review Board at the Southern Illinois University School of Medicine prior to dissemination of the survey.

Subject Recruitment

Participants were recruited from otolaryngology training programs and practices across the country in 2 ways. First, an email was sent to all chairs and residency program directors of academic otolaryngology programs. Second, the SurveyMonkey link was posted on social media platforms (Facebook and Twitter). Subjects were provided with a description of the study, and participation was voluntary. A required question was included that asked participants to self-identify as otolaryngology practitioners. If this question was answered no, the survey was terminated immediately. Otolaryngology residents, faculty (academic and private practice), and advanced practice providers (APPs) were included in this study. Those who had not yet started training, those on a leave of absence, and those who had retired from practice were excluded.

Outcomes and Covariates

Self-reported demographic data included age, gender, race, ethnicity, presence of a partner or children living in the home, title (resident, academic faculty, private practice faculty, APP), years in practice, practice geographic location, and region of practice. Subjects were also asked questions relating specifically to the COVID-19 pandemic: ''Are you practicing in a hotspot?'' ''Have you been redeployed?'' ''Have you been tested for COVID-19, and if so, what were the test results?'' When data were missing, an average was calculated for the subscale score if 1 question was left blank; if $>$1 question was left blank, a score was not calculated or reported.

Statistical Analysis

Data analysis was performed with Stata SE statistical software version 14 (StataCorp). All tests were 2-tailed, and significance level was set at $\alpha = 0.05$. Demographic variables were compared between groups with the chi-square test and Fisher exact test. The data were not normally distributed; thus, nonparametric measures (Wilcoxon rank-sum test and Kruskal-Wallis test) were utilized to assess continuous variables between groups. Multivariable linear regression models were fit to evaluate predictors of PF, WE, IPD, and overall burnout. After adjusting for potential confounders, associations between risk factors and outcomes were identified and reported as odds ratios with 95% CIs.

Results

Demographics

In this cross-sectional study, 243 surveys were conducted; however, 202 (83.1%) respondents completed the PFI portion and were included in analysis. Survey respondents consisted of 37 trainees (17.6%), 93 academic faculty (45.4%), 51 private practice physicians (24.9%), 17 academic APPs (8.3%),

Table 1. Respondent Demographics.[a]

Characteristic	All respondents (N = 202)	Residents / fellows (n = 37)	Academic faculty (n = 92)	Private practice physicians (n = 51)	*P* value[b]	Academic APP (n = 17)	Private practice APP (n = 5)	*P* value[c]
Age, y					.909			.249
<30	12 (6)	10 (27)	0	0		2 (12)	0	
30-35	51 (25)	23 (62)	14 (15)	8 (16)		5 (29)	1 (20)	
36-40	50 (25)	2 (5)	26 (28)	14 (27)		7 (41)	1 (20)	
41-45	32 (16)	2 (5)	14 (15)	13 (25)		1 (6)	2 (40)	
46-50	10 (5)	0	7 (8)	2 (4)		1 (6)	0	
51-55	16 (8)	0	10 (11)	5 (10)		0	1 (20)	
56-60	12 (6)	0	9 (10)	3 (6)		0	0	
61-65	10 (5)	0	6 (7)	3 (6)		1 (6)	0	
>65	7 (3)	0	5 (5)	2 (4)		0	0	
Prefer not to answer	2 (1)	0	1 (1)	1 (2)		0	0	
Gender					.340			>.999
Male	73 (36)	17 (46)	39 (42)	16 (31)		1 (6)	0	
Female	126 (62)	19 (51)	52 (56)	34 (67)		16 (94)	5 (100)	
Transgender male	0	0	0	0		0	0	
Transgender female	0	0	0	0		0	0	
Gender nonconforming	1 (1)	1 (3)	0	0		0	0	
Prefer not to answer	2 (1)	0	1 (1)	1 (2)		0	0	
Race					.182			.065
White	160 (79)	29 (78)	76 (83)	40 (78)		13 (76)	2 (40)	
Black	5 (2)	0	3 (3)	0		2 (12)	0	
Asian	27 (13)	5 (14)	12 (13)	7 (14)		2 (12)	1 (20)	
American Indian/Native Alaskan	0	0	0	0		0	0	
Native Hawaiian	0	0	0	0		0	0	
Other	7 (3)	3 (8)	0	2 (4)		0	2 (40)	
Prefer not to answer	3 (1)	0	1 (1)	2 (4)		0	0	
Ethnicity					.528			.043
Hispanic or Latinx	13 (6)	4 (11)	3 (3)	4 (8)		0	2 (40)	
Not Hispanic or Latinx	184 (91)	33 (89)	86 (93)	46 (90)		16 (94)	3 (60)	
Prefer not to answer	5 (2)	0	3 (3)	1 (2)		1 (6)	0	
Partner at home					.419			.100
Yes	173 (86)	28 (76)	84 (91)	45 (88)		14 (82)	2 (40)	
No	28 (14)	9 (24)	8 (9)	5 (10)		3 (18)	3 (60)	
Prefer not to answer	1 (1)	0	0	1 (2)		0	0	
Children at home					.166			>.999
Yes	125 (62)	10 (27)	63 (68)	39 (76)		10 (59)	3 (60)	
No	76 (38)	27 (73)	29 (32)	11 (22)		7 (41)	2 (40)	
Prefer not to answer	1 (1)	0	0	1 (2)		0	0	

Abbreviation: APP, advanced practice provider.
[a]Values are presented as No. (%).
[b]Academic faculty vs private practice faculty.
[c]Academic APP vs private practice APP.

and 7 private practice APPs (3.4%). Of those responding to the survey, 65% were between the ages of 30 and 45 years, 62% were female, and 79% were White. The details of the respondent demographic characteristics are presented in **Table 1**. The majority of respondents were from the Middle Atlantic region, and 36% of respondents reported practicing in a hotspot. Only 4% of respondents were redeployed and 10% had been tested for COVID-19. Additional details of practice and COVID-19–specific demographic data are outlined in **Table 2**.

PFI Results

Each answer in the PFI is scored between 0 and 4. An average item score ≥3 on the PF portion of the survey correlates with

Table 2. Practice and COVID-19 Demographics.[a]

Characteristic	All respondents (N = 202)	Residents / fellows (n = 37)	Academic faculty (n = 92)	Private practice physicians (n = 51)	*P* value[b]	Academic APP (n = 17)	Private practice APP (n = 5)	*P* value[c]
PGY								
1		5 (14)						
2		4 (11)						
3		8 (22)						
4		4 (11)						
5		13 (35)						
>5		1 (3)						
Prefer not to respond		2 (5)						
Years in practice					.320			.227
0-5			33 (36)	14 (27)		10 (59)	1 (20)	
6-10			14 (15)	14 (27)		3 (18)	2 (40)	
11-20			19 (21)	11 (22)		4 (24)	1 (20)	
≥21			26 (28)	12 (24)		0	1 (20)	
Type of practice								
Solo				8 (16)			3 (60)	
Group (≤10 ENTs)				26 (51)			2 (40)	
Group (>10 ENTs)				7 (14)			0	
Hospital employed				9 (18)			0	
Locum tenens				0			0	
Other				1 (2)			0	
Practice region					.141			.163
New England	16 (8)	2 (5)	9 (10)	4 (8)		1 (6)	0	
Middle Atlantic	44 (22)	10 (27)	20 (22)	12 (24)		1 (6)	1 (20)	
South Atlantic	29 (14)	1 (3)	14 (15)	7 (14)		6 (35)	1 (20)	
East North Central	31 (15)	13 (35)	14 (15)	3 (6)		1 (6)	0	
East South Central	21 (10)	4 (11)	8 (9)	4 (8)		5 (29)	0	
West North Central	10 (5)	2 (5)	4 (4)	2 (4)		2 (12)	0	
West South Central	14 (7)	1 (3)	10 (11)	3 (6)		0	0	
Mountain	3 (1)	0	3 (3)	0		0	0	
Pacific	15 (7)	0	4 (4)	10 (20)		0	1 (20)	
Outside USA	19 (9)	4 (11)	6 (7)	6 (12)		1 (6)	2 (40)	
COVID-19 hotspot					.535			.609
Yes	73 (36)	12 (32)	34 (37)	18 (35)		6 (35)	3 (60)	
No	128 (63)	25 (68)	58 (63)	32 (63)		11 (65)	2 (40)	
Prefer not to answer	1 (1)	0	0	1 (2)		0	0	
Redeployed					.477			>.999
Yes	8 (4)	0	4 (4)	2 (4)		2 (12)	0	
No	193 (96)	37 (100)	88 (96)	48 (94)		15 (88)	5 (100)	
Prefer not to answer	1 (1)	0	0	1 (2)		0	0	
COVID-19 testing					.796			>.999
Yes	21 (10)	2 (5)	11 (12)	7 (14)		1 (6)	0	
No	181 (90)	35 (95)	81 (88)	44 (86)		16 (94)	5 (100)	
Test result	21	2	11	7	.339	1	0	
Positive	1 (5)	0	1 (9)	0		0		
Negative	17 (81)	2 (100)	7 (64)	7 (100)		1 (100)		
Pending	3 (14)	0	3 (27)	0		0		

Abbreviations: APP, advanced practice provider; ENT, otolaryngologist; PGY, postgraduate year.

[a]Values are presented as No. (%).

[b]Academic faculty vs private practice faculty.

[c]Academic APP vs private practice APP.

fulfillment, while an average item score $\geq$1.33 correlates with burnout. WE and IPD items are combined to create the overall burnout score. The 6-item PF section had a median composite score of 13 (IQR, 7-16) and average item score of 2.17 (IQR, 1.17-2.67). Of 202 subjects, 29 had an average score $\geq$3.00, indicating that 14.4% of respondents experienced high PF. Within the 4-item WE section, the median composite score was 5 (IQR, 3-8) with an average item score of 1.25 (IQR, 0.75-2). Of 202 subjects, 92 had an average WE score $\geq$1.33, indicating that 45.5% experienced significant WE. The 6-item IPD section had a median composite score of 5 (IQR, 1-9), with an average item score of 0.83 (IQR, 0.17-1.5). Of 202 subjects, 67 had an average IPD score $\geq$1.33, indicating that 33.2% experienced significant IPD. The combined 10-item burnout scale (WE + IPD) had a median composite score of 10 (IQR, 5-17) with an average item score of 1 (IQR, 0.5-1.7). Of 202 subjects, 81 had an average score $\geq$1.33, indicating high burnout in 40.1% of respondents.

Univariate Analysis: PF and Burnout

Within the univariate analysis, PF, WE, IPD, and overall burnout scores were tabulated by demographics factors (**Tables 3** and **4**). Female respondents experienced significantly lower PF (12 vs 15, $P = .002$), higher WE (6 vs 3, $P < .001$), higher IPD (6 vs 3, $P = .011$), and higher overall burnout (12 vs 6, $P < .001$) than male respondents. With an average score cutoff of 3.00, 7.9% of female respondents experienced high PF, as opposed to 26.0% of male respondents. With an average score cutoff of 1.33, 44.4% of female respondents experienced significant burnout, as compared with 24.6% of male respondents. Private practice physicians experienced less PF when compared with academic faculty (10 vs 13, $P = .024$).

Multivariable Analyses

Multivariable linear regression models were fit (**Table 5**). Females had statistically lower PF (beta = -2.28, $P = .010$) with higher rates of WE (beta = 0.62, $P < .001$), IPD (beta = 2.08, $P = .023$), and burnout (beta = 4.49, $P = .002$).

Multivariable linear regression models were fit comparing residents and faculty (**Table 6**). Within the resident subgroup, residents with children at home were more likely to experience higher IPD (beta = 0.044, $P = .044$). In addition, female gender within the resident subgroup was not predictive of PF, WE, IPD, or burnout. However, within the faculty subgroup, female gender influenced PF (beta = -2.44, $P = .025$), WE (beta = 2.88, $P < .001$), IPD (beta = 2.99, $P = .005$), and burnout (beta = 5.87, $P < .001$). Faculty members who were redeployed were more likely to suffer from burnout (beta = 2.03, $P = .045$).

Discussion

The PFI is a tool that was created to better assess wellness variables that are specific to physicians while focusing on positive and negative aspects of their careers and is suited to assess changes over time.[14] Other burnout assessment tools are the Maslach Burnout Inventory (MBI), which asks respondents to evaluate as far back as a year and is therefore not likely the appropriate instrument to evaluate acute changes or interventions. The PFI evaluates the preceding 2 weeks and is thus better suited to evaluate abrupt changes as might be seen in the setting of a crisis or evolving pandemic. The PF subscale aims to assess the degree of positivity derived from one's work and includes happiness, meaningfulness, contribution, self-worth, satisfaction, and feeling in control at work. The WE subscale assesses symptoms of exhaustion and is like the domain assessed by the emotional exhaustion scale of the MBI.[14] The IPD is somewhat different from the MBI depersonalization and aims to more accurately assess physician empathy and connectedness to patients and colleagues.[14]

Burnout among academic otolaryngologists is common.[13,15-17] One study measured burnout by using the Maslach Burnout Inventory–Human Services Survey, which was distributed to 562 members of the Society of University Otolaryngo-logists, of which 351 successfully completed it. Within this study, otolaryngology residents had the highest level of burnout, followed by otolaryngology chairs and associate professors.[13,17] In addition, 86% of otolaryngology residents reported moderate or high burnout, and 70% of otolaryngology faculty indicated moderate or high burnout. Factors that have been shown to be associated with burnout in academic otolaryngologists include dissatisfaction with the balance between personal and professional life, low self-efficacy, inadequate research time, and inadequate administration time.[13] While many of these baseline factors have persisted during the COVID-19 pandemic, other novel factors have been introduced necessitating the evaluation of their impact.

This survey was distributed to academic and private practice otolaryngologists for completion by faculty, APPs, and residents. Nearly 80% of all respondents did not feel a sense of PF at work, while about 40% experienced significant burnout. Further analysis of independent variables found the impact that female gender had on PF, WE, IPD, and overall burnout. Females felt less professionally fulfilled and had increased WE, IPD, and overall burnout when compared with males. In univariate and adjusted multivariable models, female gender was the only independent variable that was significantly associated with all 4 wellness variables. In subgroup analyses, female gender was significantly associated with all 4 wellness variables in the faculty subgroup, but gender was not associated with these wellness variables in the resident subgroup. This suggests that there could be certain factors in residency programs that protect female physicians from burnout. It has been shown that female residents often delay having children.[18] This could contribute to the finding that female gender is not associated with burnout in the resident group. Previous publications have demonstrated that female physicians are more likely to experience burnout.[19,20] Kannampallil et al found that female health care provider burnout was associated with increased stress related to childcare and work-life balance.[20] Surveys result in selection bias, as the participation is optional. It is possible that women are more likely to complete a survey related to burnout and job

Table 3. PF and Burnout by Respondent Demographics.[a]

Characteristic	Composite score, median (IQR)			
	PF	WE	IPD	Burnout
Group				
RF	13 (9-16)	4 (3-7)	6 (2-10)	10 (5-15)
Academic faculty	**13 (8-17)**	5 (2-8)	4 (1-8.5)	8.5 (4-16)
PP faculty	**10 (6-15)**	6 (3-8)	6 (2-10)	12 (6-19)
Academic APP	12 (9-15)	5 (2-6)	4 (1-7)	8 (5-12)
PP APP	15 (6-16)	6 (5-9)	2 (2-12)	8 (7-21)
P value				
RF vs academic faculty	.902	.529	.263	.673
Academic vs PP faculty	**.024**	.177	.140	.101
Academic vs PP APP	.937	.429	.906	.753
Age, y				
≤40	13 (7-16)	5 (3-8)	6 (2-10)	10 (6-17)
41-65	13 (8-16)	5 (2-8)	4 (1-9)	8 (4-16.5)
>65	13 (3-18)	3 (0-8)	4 (0-6)	4 (3-14)
P value	.567	.344	.201	.218
Gender				
Male	**15 (10-18)**	**3 (1-5)**	**3 (1-7)**	**6 (3-12)**
Female	**12 (7-15)**	**6 (4-8)**	**6 (1-10)**	**12 (7-18)**
P value	**.002**	**<.001**	**.011**	**<.001**
Race				
White	13 (7.5-16)	5 (3-8)	5 (2-9)	10 (5-16.5)
Black	17 (15-18)	5 (2-6)	1 (0-5)	6 (3-11)
Asian	13 (7-16)	5 (3-8)	4 (1-10)	8 (5-17)
Other	15 (8-16)	6 (0-7)	4 (2-8)	8 (4-15)
P value	.223	.748	.518	.543
Ethnicity				
Not Hispanic of Latinx	13 (8-16)	5 (3-8)	5 (1.5-9)	10 (5-17)
Hispanic or Latinx	14 (5-15)	3 (2-11)	3 (2-12)	8 (3-23)
P value	.878	.898	.995	.866
Partner at home				
No	13 (8.5-16)	5.5 (3.5-8.5)	2.5 (1-9)	8 (5-17.5)
Yes	13 (7-16)	5 (2-8)	5 (2-9)	10 (5-16)
P value	.970	.377	.249	.900
Children at home				
No	13 (8-16)	5 (2.5-8)	4.5 (.5-10)	8 (4-16.5)
Yes	13 (7-16)	5 (3-8)	5 (2-9)	10 (5-17)
P value	.874	.549	.429	.468

Abbreviations: APP, advanced practice provider; IPD, interpersonal disengagement; IQR, interquartile range; PF, professional fulfillment; PP, private practice; RF, resident/fellow; WE, work exhaustion.

[a]Statistically significant results ($P < .05$) are shown in bold.

satisfaction as they experience burnout themselves and want to contribute to studies addressing research in burnout.

Female burnout may have more prevalence for a number of reasons. A largely accepted hypothesis is the management of work-life balance. Early on during the COVID-19 pandemic, families were trying to navigate the frequent work and personal changes. Families had to arrange for childcare when schools and daycares were closed. The pandemic also resulted in families pulling their elderly family members from nursing care facilities. As females are more likely to adopt the caregiver duties at home, they likely were left with handling a multitude of responsibilities that were once managed by others. The presence of children at home was significant for the wellness variable IPD within the resident subgroup, as seen in **Table 6**. However, it is worth noting that our study did not find the presence of children at home to be statistically significant within the faculty subgroup. There are several reasons for this finding, a few of which being that we did not assess who at home undertook the primary caregiver role, whether there were multiple children living at home, or what

Table 4. PF and Burnout by Practice and COVID-19 Demographics.[a]

Characteristic	Composite score, median (IQR)			
	PF	WE	IPD	Burnout
PGY[b]				
1-2	15 (14-17)	3 (2-5)	4 (3-8)	8 (4-10)
3-4	13 (10-15)	4.5 (3.5-9.5)	8.5 (3-12.5)	14 (6.5-2.5)
≥5	12.5 (7-17)	4.5 (3-7)	5.5 (1-8)	9 (6-14)
P value	.219	.392	.322	.392
Faculty years in practice[c]				
0-5	11 (7-15)	**7 (4-10)**	7 (2-11)	**14 (6-19)**
6-10	12 (6-15)	**5.5 (2.5-7.5)**	3.5 (1-8.5)	**7.5 (3-17.5)**
11-20	11.5 (8-16)	**7 (5-8)**	5.5 (3-9)	**12.5 (7-19)**
≥21	14 (11-17)	**3 (2-7)**	3 (0-7)	**6 (3-14)**
P value	.227	**.008**	.101	**.015**
Type of private practice[d]				
Solo	8 (5-15)	7 (4-9)	3 (1-11)	8 (7-19)
Group (≤10 ENTs)	10 (6-15)	6 (4-8.5)	7.5 (1.5-11.5)	14 (6-20)
Group (>10 ENTs)	13 (9-15)	3 (1-8)	5 (3-11)	8 (3-19)
Hospital employed	13 (5-14)	5 (3-8)	5 (2-8)	10 (5-14)
P value	.861	.690	.910	.880
Country				
Outside USA	13 (8-15)	6 (4-8)	4 (2-9)	11.68 (6-16)
USA	13 (7-16)	5 (3-8)	5 (1-9)	10 (5-17)
P value	>.999	.733	.993	.833
Practice region				
Northeast	14 (7-17)	4 (2-8)	4.5 (1-7.5)	8 (4.5-15)
Midwest	13 (8-6)	5 (3-7)	4 (1-9)	8 (4-15)
South	12.5 (8-15)	5 (2-9)	5.5 (2-10)	11 (5-18.5)
West	9.5 (7-15)	7.5 (5-8)	7.5 (1-11)	15 (6-19)
P value	.335	.230	.745	.501
COVID-19 hotspot				
No	13 (7-16)	5 (3-8)	5 (2-9)	9.5 (5-17)
Yes	13 (8-16)	5 (2-7)	2 (1-10)	10 (5-16)
P value	.444	.532	.985	.780
Redeployed				
No	13 (7-16)	**5 (2-8)**	5 (1-9)	**9 (5-16)**
Yes	12 (9-14)	**8 (5.5-10)**	9 (5.5-11)	**18 (11-20)**
P value	.726	**.038**	.089	**.042**
COVID-19 testing				
No	13 (7-16)	5 (3-8)	5 (2-10)	10 (5-17)
Yes	13 (11-15)	6 (3-8)	5 (1-8)	11 (5-17)
P value	.990	.665	.708	.980

Abbreviations: ENT, otolaryngologist; IPD, interpersonal disengagement; IQR, interquartile range; PF, professional fulfillment; PGY, postgraduate year; WE, work exhaustion.

[a]Statistically significant results ($P < .05$) are shown in bold.

[b]Only residents and fellows are included in this row.

[c]Only faculty are included in this row.

[d]Only private practice physicians and advanced practice providers are included in this row.

ages the children were. It would be of benefit to further assess burnout in females with a physician partner vs nonphysician partner as this could support the idea of the increase in at-home work that came with the pandemic. Another hypothesis is the overall underrepresentation of females in the field of otolaryngology. According to the AAMC 2020 Physician Specialty Data Report, the field of otolaryngology was composed of roughly 18.3% female physicians.[21] This underrepresentation results in a lack of role models and mentorship available for females in the field. Mentorship can be perceived

Table 5. Linear Regression Models of Outcomes: PF, WE, IPD, and Overall Burnout.[a]

	PF		WE		IPD		Burnout	
Variable	Beta coefficient	*P* value	Beta coefficient	*P* value	Beta coefficient	*P* value	Beta coefficient	*P* value
Title: academic faculty[b]								
Resident/fellow	0.29	.810	−0.79	.356	1.02	.420	0.23	.907
Private practice physician	−1.56	.100	0.27	.689	0.62	.533	0.88	.565
Academic APP	−0.11	.940	−1.32	.198	−0.78	.605	−2.10	.371
Private practice APP	−1.62	.541	0.40	.831	4.20	.130	4.60	.286
Age, y: ≤40[b]								
41-65	0.75	.407	−0.001	.999	−0.91	.336	−0.92	.535
>65	1.46	.570	−1.89	.298	−2.06	.442	−3.96	.343
Gender: female	**−2.28**	**.010**	**0.62**	**<.001**	**2.08**	**.023**	**4.49**	**.002**
Race: White[b]								
Black	4.52	.095	−0.86	.653	−2.15	.446	−3.01	.492
Asian	0.03	.977	−0.62	.430	−0.69	.548	−1.31	.465
Other	2.60	.309	−2.54	.161	**−5.49**	**.041**	−8.03	.054
Ethnicity: Hispanic or Latinx	−0.12	.945	0.39	.753	1.98	.283	2.37	.407
Partner at home	−0.48	.684	−0.40	.637	2.12	.087	1.73	.369
Children at home	0.43	.643	−0.20	.754	0.03	.972	−0.17	.910
COVID-19 hotspot	−0.01	.986	−0.24	.673	0.33	.696	0.09	.946
Redeployed	0.07	.972	2.18	.110	2.36	.240	4.55	.146

Abbreviations: APP, advanced practice provider; IPD, interpersonal disengagement; PF, professional fulfillment; WE, work exhaustion.
[a]Statistically significant results ($P < .05$) are shown in bold.
[b]Baseline.

Table 6. Subgroup Linear Regression Models of Outcomes: PF, WE, IPD, and Overall Burnout.

	PF		WE		IPD		Burnout	
Predictor variable[a]	Beta coefficient	*P* value	Beta coefficient	*P* value	Beta coefficient	*P* value	Beta coefficient	*P* value
Subgroup: residents[b]								
Race: White[c]								
Asian			−1.14	.482	−2.02	.462	−3.16	.429
Other			−6.48	.016	−9.34	.039	−15.8	.018
Children at home					−4.78	.044		
Subgroup: faculty[d]								
Gender: female	−2.44	.025	2.88	<.001	2.99	.005	5.87	<.001
Redeployed							2.03	.045

Abbreviations: IPD, interpersonal disengagement; PF, professional fulfillment; WE, work exhaustion.
[a]Only significant variables are shown ($P < .05$).
[b]For regression models for the resident subgroup, independent variables in the models were age, gender, race, ethnicity, presence of a partner at home, presence of children at home, postgraduate year, and practicing in a COVID-19 hotspot. Redeployment was not included in the models since no residents were redeployed.
[c]Baseline.
[d]For regression models for the faculty subgroup, independent variables in the models were title (academic vs private practice), age, gender, race, ethnicity, presence of a partner at home, presence of children at home, years in practice, practicing in a COVID-19 hotspot, and being redeployed.

as a protective factor for burnout as it allows for empathy and support from colleagues.

With the new challenges being faced specifically by otolaryngology providers in the setting of the COVID-19 pandemic, departmental and practice leadership should be prepared to implement programs to minimize the impact of the pandemic on burnout and professional satisfaction. Not only is this critical for morale, but burnout among surgeons has been shown to be strongly correlated with major medical errors.[22] It would also be wise for national organizations to be aware of the potential short- and long-term impacts that could be seen to provide guidance on how to mitigate these effects. It is

important that practitioners not be singled out or stigmatized in the setting of burnout, but there should instead be broad-reaching programs for burnout management. Siegel and Nagengast reported that job satisfaction, job engagement, and compassion satisfaction protect from burnout.[23] Additionally, there needs to be institutional support for personal commitment to self-care. These critical factors should be included when considering the implementation of any wellness program or initiative at any level.

Limitations

This study is subject to several limitations. This survey represents a cross-sectional study in which subjects reported their status over the preceding 2 weeks. Professional satisfaction and burnout are dynamic and likely to vary throughout the pandemic and beyond. This survey was done during a period in which some regions had already experienced their peak while others were entering theirs, which could lead to potential variation in the responses to questions regarding professional satisfaction and burnout. This survey was disseminated to academic institutions across the country through department chairs and program directors. It is possible that there was differential dissemination of the survey depending on how program leaders were personally feeling about or affected by the pandemic at that time. The survey was also disseminated through social media platforms to reach a wider audience, including private practice physicians. This could skew the results by excluding those who do not utilize social media. In any survey, there is a risk of response bias, as those who feel most strongly about the subject may respond and may not be a representative group. Last, baseline (ie, prepandemic) professional satisfaction and burnout were not assessed.

Conclusion and Summary Statement

Early in the COVID-19 pandemic, a majority of participants reported a lack of PF in their work while just under half experienced burnout. We found that female gender was associated with low PF and high WE, IPD, and overall burnout. This finding could be due to the impact of personal stressors as well as new work stressors created by the COVID-19 pandemic. Attention to burnout and job satisfaction during a pandemic is critical to ensure the appropriate well-being of otolaryngology practitioners.

Author Contributions

Rachel Karras, literature review, analysis of results, manuscript writing, presentation of the research; **Sophia Matos**, literature review, analysis of results; **Arun Sharma**, concept, survey design, literature review, statistical analysis, manuscript writing; **Dana L. Crosby**, concept, survey design, literature review, analysis of results, manuscript writing.

Disclosures

Competing interests: None.

Sponsorships: None.

Funding source: None.

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