AOS Thesis

LGBTQ+ Identity and Ophthalmologist Burnout

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• PURPOSE: To evaluate lesbian, gay, bisexual, transgender, questioning, and other sexual/gender minority (LGBTQ+) orientation as a burnout risk factor among an international ophthalmologist cohort.

• METHODS: An anonymous, cross-sectional electronic survey was distributed via an Internet platform to characterize the relationship among demographic factors, including LGBTQ+ orientation, and burnout as measured by the Copenhagen Burnout Inventory (CBI). Univariable data analysis (linear) by sexual orientation was performed and variables with an association with a P value of <0.15 in univariable analysis were included in the multiple linear regression modeling.

• RESULTS: A total of 403 ophthalmologists participated in the survey. The majority self-identified as "White" (69.2%), were from North America (72.0% United States, 18.6% Canada) and were evenly distributed between age of 30 and 65 years. Overall, 13.2% of participants identified as LGBTQ+ and 98.2% as cisgender. Approximately 12% had witnessed or experienced LGBTQ+-related workplace discrimination or harassment. The personal and work-related burnout scores and confidence limits of persons identified as LGBTQ+ were higher and nonoverlapping compared with those reported as non-LGBTQ+. Multivariable analysis identified significant risk factors for higher personal and work-related burnout scores: LGBTQ+ (11.8 and 11.1, $P = .0005$ and .0023), female gender (5.36 and 4.83, $P = .0153$ and .0434), older age (19.1 and 19.2, $P = .0173$ and .0273). and caretaker stress (6.42 and 5.97, $P = .0085$ and .0239).

• CONCLUSIONS: LGBTQ+ orientation is a burnout risk factor among ophthalmologists, and LGBTQ+ workplace discrimination may be a contributing factor. Support from ophthalmology organizations to address LGBTQ+-, gender-, and age-related workplace discrimination may decrease burnout. NOTE: Publication of this article is sponsored by the American Ophthalmological Society. (Am J Ophthalmol 2023;246: 66–85. © 2022 Elsevier Inc. All rights reserved.)

Burnout is a syndrome of emotional exhaustion, depersonalization, and a sense of reduced personal accomplishment attributed to chronic stress associated with inadequate resources in performing emotionally intense work.[1,2] Specifically, emotional exhaustion describes a feeling of emotional overextension and an inability to empathize, whereas depersonalization is the increased tendency to view and treat people as objects. A sense of reduced personal accomplishment, or not feeling competent and having successful achievement in one's work, often leads to moral distress and is a leading cause of worker turnover and attrition.[3-5]

The concept of burnout was first introduced in 1974 by German-born psychologist Herbert J. Freudenberger, who described a constellation of maladaptive reactions to work-related stress manifesting as physical, emotional, and mental exhaustion.[6] Shortly afterward, the introduction and validation of several questionnaire instruments, such as the Maslach Burnout Inventory and the Copenhagen Burnout Inventory (CBI), allowed for the standardized quantification and classification of major burnout symptoms. In the following years, burnout was studied in many service-related fields, especially those involving helping others and self-sacrifice.[2,7,8]

The topic of physician burnout first appeared in medical literature in 1981.[9] At the time, it was described as "a state… marked by physical depletion and chronic fatigue, feelings of hopelessness and helplessness, and the development of a negative self-concept and attitude toward work, life, and other people." The author further ex-

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panded that "[when] people in the helping professions burn out, they frequently lose concern and feelings for their patients and clients and come to treat them in detached and even dehumanized ways."[9] Nearly 3 decades later, in 2009, the outcomes of the first interventional trial aimed to decrease burnout in primary care physicians was published.[10] However, the wider scope and implications of physician burnout were made apparent only in 2012, when a survey by the American Medical Association of a large sample of physicians across all specialties in the United States revealed that nearly half have experienced burnout symptoms.[11] In 2019, burnout was officially recognized in the 11th Revision of the *International Classification of Diseases* as a syndrome (distinct from an illness or health condition) resulting from "workplace stress that has not been successfully managed" (https://icd.who.int/en/docs/ICD11-license.pdf).

Prior to the 2019 coronavirus disease (COVID-19) pandemic, the prevalence of physician burnout was between 54% and 67%.[12,13] In ophthalmology, pre-COVID burnout prevalence was estimated to be approximately 37%, compared to 18% in the United States general work force.[14-17] After COVID-19 was declared a global pandemic by the World Health Organization on March 11, 2020, the prevalence of physician burnout reached new heights and became a healthcare crisis.[18-23] Several cross-sectional studies estimated increasing prevalence of physician burnout in the ensuing months as the pandemic unfolded: 68.7% between May and June 2020 (Portugal), 70.7% between August and November of 2020 (Austria), and 71% in March 2021 (Brazil).[24-26] The post-COVID prevalence of burnout in ophthalmology remains unknown. However, as many factors contributing to burnout, such as increased caretaker responsibilities at home, poor sleep, and electronic health record documentation requirements apply equally to physicians in different specialties, the post-COVID-19 increase in burnout prevalence likely applies to ophthalmologists as well.[27-30]

Physician burnout has significant negative impacts on patient care, healthcare economy, and physician well-being. Burnout is correlated with longer patient wait time, suboptimal patient care, increased medical errors, increased medical–legal risks, and consequently lowered patient experience.[1,31-36] A meta-analysis found a statistically significant negative relationship between physician burnout and quality of care ($r = -0.26$) as well as burnout and patient safety ($r = -0.23$).[37] Physicians experiencing burnout are more likely to leave healthcare, and replacing physicians to maintain a stable workforce can be expensive. Together, the lost revenue from physician attrition and turnover due to burnout, with the cost of replacing physicians, is estimated to be $2.6 billion to $6.3 billion each year in the United States.[38,39] Burnout is also detrimental to the physician's mental and physical health, resulting in harmful coping mechanisms such as alcohol and/or illicit drug use, clinical depression, and suicidality.[18,40,41] Thus, to maintain a sustainable healthcare workforce to meet the increasing demands of an aging population, the mitigation and prevention of burnout is a professionwide imperative.

Several demographic risk factors have been consistently associated with physician burnout, including female gender, younger age, and home caretaker stress.[42-44] Although physicians who are lesbian, gay, bisexual, transgender queer, and other sexual/gender minorities (LGBTQ+) experience most of the same risk factors for burnout as non-LGBTQ+ physicians, they may experience additional stressors from social marginalization and mistreatment at the workplace.[45-48] Although a physician's personal life may seem to play little to no part in his/her clinical practice, the reality is far more complex. Building successful, long-term professional and therapeutic relationships with coworkers and patients inevitably involves some intersections of one's professional and personal spheres, and the psychological stress of both orientation disclosure and nondisclosure are immense and cumulative.[49,50] Nondisclosure, especially with patients, may pose philosophical/ethical dilemmas resulting in moral distress, whereas disclosure may invite discrimination and/or harassment.[48,51-53] In a 2004 editorial in the *British Medical Journal*, David Hughes wrote, "Although health professionals may resolve in advance either to be open about their sexual orientation (to "out" themselves) or to avoid disclosure… it would be unrealistic to think that every routine consultation could be prefaced by an explanation of sexual preference. Most practitioners find themselves carefully negotiating their way through interactions, making decisions from one moment to the next about how relevant their sexual identity may be to the situation and just how open to be."[54] Recently, a report by the Human Rights Campaign Foundation (https://www.hrc.org/resources/a-workplace-divided-understanding-the-climate-for-lgbtq-workers-nationwide) titled "A Work Place Divided" highlighted many stressors and obstacles faced by LGBTQ+ Americans in the work place. From a sample of 1615 respondents (804 LGBTQ+ and 811 non-LGBTQ+), 46% of LGBTQ+ workers reported being "closeted" at work, and 50% of non-LGBTQ+ workers were unaware of any "out" LGBTQ+ workers in their workplace; 28% of LGBTQ+ workers also feel compelled to misrepresent their personal lives at work, and 17% and 13% reported emotional exhaustion from hiding their sexual orientations and gender identities, respectively.[55]

LGBTQ+ orientation has been established as an important burnout risk factor in physicians. A number of cross-sectional surveys showed that LGBTQ+ medical students were more likely to experience burnout than were non-LGBTQ+ students, which was attributed to mistreatment and less favorable perception of their learning environment.[56-59] In one survey of 3898 anesthesiologists, self-reported LGBTQ+ status was associated with an increased

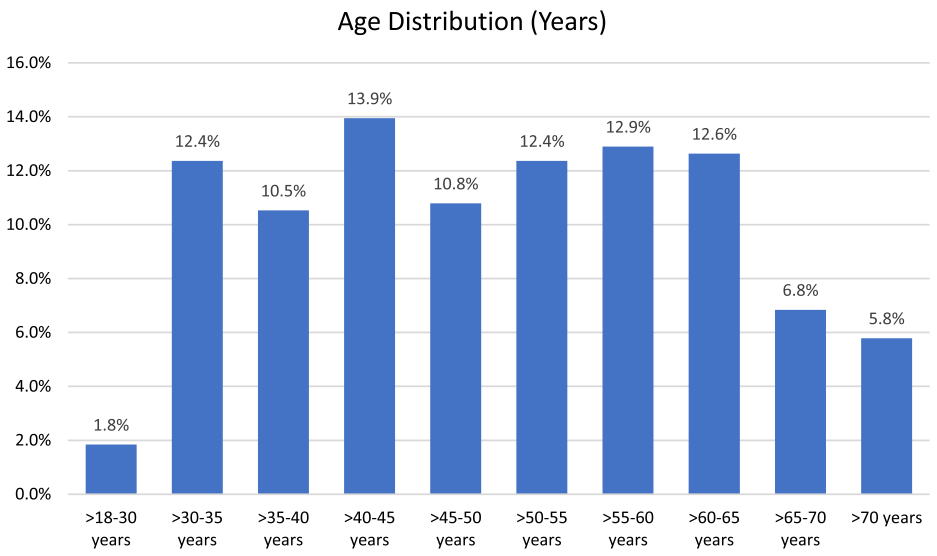

FIGURE 1. Age distribution of 403 survey participants.

odds ratio (2.21; 95% CI = 1.35-3.63) for burnout.[60] However, LGBTQ+ orientation and burnout have not been studied in the ophthalmology community. Based on the prior findings, we hypothesize that being LGBTQ+ is associated with increased burnout among ophthalmologists, and we performed a cross-sectional study to test our hypothesis.

METHODS

The study protocol was prospectively approved by the Institutional Review Board (IRB) of the University of Miami Miller School of Medicine (ID 20171092, MOD00051055). Specifically, the IRB approved the dissemination of anonymous electronic surveys to and collection of responses from members of ophthalmological professional societies and/or academic institutions as approved by the organizations' leadership. Written consent was waived. The study protocol adhered to the tenets of the Declaration of Helsinki and all federal and state laws of the participating countries.

• **OVERALL DESIGN:** The study is an anonymous, cross-sectional electronic survey distributed via the Internet platform SurveyMonkey (www.surveymonkey.com) to the ophthalmology community to characterize the relationship between various demographic factors, including LGBTQ+ identity, and physician burnout as measured by a validated instrument.

• **SURVEY FORMAT AND CONTENT:**

Introduction and instructions

The survey began with the title "Work Place Diversity" and an introductory letter, which specifically invited all ophthalmological care providers to answer the survey anonymously. The participants were encouraged to share the survey link with ophthalmology colleagues and to answer the survey only once (if invited to participate multiple times). An electronic glossary for diversity-related terms was included (https://lgbtc.vpul.upenn.edu/wp-content/uploads/2020/07/Terminology_iQueer.pdf).

Demographic factors

The participants were asked to provide background demographic factors. Practice-related factors including practice focus (comprehensive vs specialty practice), practice type (academic vs private vs government, etc), number and area of fellowship training, membership in various professional ophthalmological societies, and geographic location (country and state). Personal factors included age, sex assigned at birth, gender identity, sexual orientation, race/ethnicity, and relationship status. Gender identity had 9 forced-choice categories with a 3-by-3 cross table of "woman," "man," "nonbinary" and "cisgender," "transgender," and "genderfluid." Sexual orientation included 7 forced-choice categories (non-LGBTQ+, lesbian, gay, bisexual, asexual, pansexual, queer/questioning) and "other" (with textbox), and race/ethnicity choices were based on the United States Census categories (American Indian/Alaska Native, Asian, Black or African American, Hispanic or Latino, Native Hawaiian or other Pacific Islander, and White, www.census.gov) and "prefer not to answer" and "other" (with textbox). In addition, the participants were specifically asked whether they were the main caretaker of young children and/or other family members at home and whether this was a significant source of stress ("yes to both" vs "no to either").

TABLE 1. Personal Demographic Characteristics

Demographic Factors	N	%
Gender assigned at birth	386 (available)	
Female	157	40.7
Male	224	58.0
Neither	1	0.3
Prefer not to answer	4	1.0
Sexual orientation	386 (available)	
Non-LGBTQ+	335	86.8
Gay	32	8.3
Bisexual	8	2.1
Lesbian	5	1.3
Pansexual	3	0.8
Queer/questioning	2	0.5
Asexual	0	0.0
Race/ethnicity	396 (available)	
White	267	69.2
Asian	54	14.0
Prefer not to answer	23	6.0
Hispanic or Latino	21	5.4
Black or African American	16	4.2
Other	14	3.6
Native Hawaiian or Other Pacific Islander	2	0.5
American Indian or Alaska Native	1	0.3
Relationship status	386 (available)	
Single	34	8.8
In a monogamous relationship	332	86.0
In a non-monogamous relationship	12	3.1
Other	8	2.1
Caretaker stress at home	386 (available)	
Yes	108	28.0
No	278	72.0

LGBTQ+ = lesbian, gay, bisexual, transgender, questioning and other sexual orientation and gender minorities.

Copenhagen Burnout Inventory

The Copenhagen Burnout Inventory (CBI) is a validated burnout measurement instrumentthat is widely used in prospective longitudinal studies.[7,61-64] It consists of a list of questions across 3 domains: personal burnout (6 questions), work-related burnout (7 questions), and client-related burnout (6 questions). Specifically, personal burnout is defined as "the degree of physical and psychological fatigue and exhaustion experienced by the person," whereas work-related burnout is defined as "the degree of physical and psychological fatigue and exhaustion that is perceived by the person as related to his/her work," and client-related burnout is defined as "the degree of physical and psychological fatigue and exhaustion that is perceived by the person as related to his/her work with clients." The questions are answered with a 5-item Likert scale with weighted point values, and the scores were averaged for each domain and ranged from 0 (lowest degree of burnout) to 100 (highest degree of burnout).[61] A large cross-sectional population-based study consisted of 1914 participants across 7 different workplace types and provided the baseline mean scores for personal burnout (35.9), work-related burnout (33.0), and client-related burnout (30.9). The survey included the questions from the personal burnout and work-related burnout domains (13 questions total). Because the validation of the CBI did not specifically include physicians, the client-related burnout questions were not included because the authors believed that substituting "pa-

TABLE 2. Work-Related Demographic Characteristics

Demographic Factors	N	%
Practice focus		
Specialty practice	315	78.2
Comprehensive practice	42	10.4
Fellow	18	4.5
Resident	17	4.2
Other	7	1.7
Non-clinical researcher	4	1.0
Practice type		
Private practice	178	46.8
Academic institutions	126	33.2
Mixed practice settings	45	11.8
Other	24	6.3
Government practice	7	1.8
Subspecialty training		
Pediatrics	142	35.2
Glaucoma	110	27.3
None	110	27.3
Oculoplastics	60	14.9
None	43	10.7
Cornea	19	4.7
Other	19	4.7
Medical retina	17	4.2
Surgical retina	16	4.0
Neuro-ophthalmology	15	3.7
Responses	10	2.5
Uveitis	5	1.2
Ocular oncology	5	1.2
Pathology	1	0.3
Membership in organization		
AAPOS	146	36.2
AGS	102	25.3
COS	73	18.1
ASCRS	55	13.7
Other	52	12.9
ASOPRS	50	12.4
IOS	21	5.2
ASRS	18	4.5
APAO	1	0.3

AAPOS = American Association of Pediatric Ophthalmology and Strabismus; AGS = American Glaucoma Society; APAO = Asia-Pacific Academy of Ophthalmology; ASCRS = American Society of Cataract and Refractive Surgery; ASOPRS = American Society of Ophthalmic Plastic and Reconstructive Surgery); ASRS = American Society of Retina Specialists; COS = Canadian Ophthalmological Society; IOS = Israeli Ophthalmological Society.

TABLE 3. Gender Identity Among Ophthalmologists

	Cisgender[a]	Transgender[a]	Genderfluid[a]	Total
Woman, n (%)	158 (98.8%)	1 (0.6%)	1 (0.6%)	160
Man, n (%)	221 (99.1%)	0 (0.0%)	2 (0.9%)	223
Nonbinary,[a] n (%)	1 (33.3%)	0 (0.0%)	2 (66.7%)	3
Total N	380	1	5	386

[a]Cisgender = current gender and birth gender align; Transgender = current gender and birth gender do not align; Genderfluid = not conforming to fixed gender roles regardless of birth gender; Nonbinary = a gender identity or expression that is neither entirely male nor entirely female.

tients" for "clients" in the CBI language would not represent the physician–patient dynamics accurately and that the findings of "client-related burnout" may not be an adequate representation of "patient-related burnout."

Epilogue

The survey concluded with 2 questions with open textboxes: "Are there any additional questions we have not asked that you wished we had asked?" and "What more can professional societies do to increase/maintain diversity and inclusion in ophthalmology?"

• **PARTICIPANTS:** The electronic survey was disseminated to multiple ophthalmological professional societies by electronic mailing listserv (American Glaucoma Society, American Association of Pediatric Ophthalmology and Strabismus, Canadian Ophthalmological Society) and by posting an electronic link and/or quick response (QR) matrix barcode in society newsletters (American Society of Cataract and Refractive Surgery, American Society of Retina Specialists). In addition, the survey was also sent to multiple academic centers' ophthalmology departments in Taiwan and Israel and was posted on several ophthalmology-related social media webpages on Facebook (www.facebook.com), Instagram (www.instagram.com), and LinkedIn (www.linkedin.com). Five regional professional societies (2 based in Asia, 2 based in the Middle East region, and 1 society based in Africa) were approached but declined to disseminate the survey to their members.

• **STATISTICAL ANALYSIS:** For all survey answers, simple descriptive analyses were used. Number and proportion were reported for categorical data, and mean and standard deviation were generated for continuous data. Our primary demographic factor of interest was sexual orientation, categorized as "non-LGBTQ+" and "LGBTQ+." Race/ethnicity categories were re-categorized as "White," "Asian," and "Other." The sample sizes for "Black or African American" and "Hispanic or Latino" physicians were low, and to draw any statistically useful conclusions,

TABLE 4. Duration Since Training and Practice Type Between Non-LGBTQ+ and LGBTQ+ Ophthalmologists

	Non-LGBTQ+ (N = 333)	LGBTQ+ (N = 47)	*P* value	Statistic
Practicing vs in-training				
In-training, n (%)	24 (7.2%)	7 (14.9%)	**.0385**	Chi-square
Practicing, n (%)	302 (90.7%)	37 (78.7%)		
Other, n (%)	7 (2.1%)	3 (6.4%)		
Years (mean ± SD) since training	19.1 ± 12.7	11.4 ± 11.6	**.0001**	Pooled Satterthwaite
Academic vs non-academic				
Academic institution	109 (32.7%)	17 (36.2%)	.116	Chi-square
Other	224 (67.3%)	30 (63.8%)		

LGBTQ+ = lesbian, gay, bisexual, transgender, questioning and other sexual orientation and gender minorities.

TABLE 5. Personal and Work-Related Burnout Scores as Measured by the Copenhagen Burnout Inventory Between Non-LGBTQ+ and LGBTQ+ Ophthalmologists

Personal burnout	Mean	SD	Lower 95% CL for Mean	Upper 95% CL for Mean	Difference Significant?
Overall	44.7	20.7			
Non-LGBTQ+ (N = 334)	43.1	20.5	40.8	45.4	
LGBTQ+ (N = 51)	55.7	18.5	50.1	61.3	Yes[a]
Work-related burnout					
Overall	39.4	21.9			
Non-LGBTQ+	37.7	21.5	35.5	40.3	
LGBTQ+	49.8	22.0	43.1	56.5	Yes[a]

CL = confidence limit; LGBTQ+ = lesbian, gay, bisexual, transgender, questioning and other sexual orientation and gender minorities.

[a]The upper and lower 95% confidence limits of 1 group are outside of those of the comparison group.

we have categorized them into a single group "Other" along with "American Indian or Alaska Native," "Native Hawaiian or Other Pacific Islander." We compared the characteristics at the time of survey by sexual orientation using the Pearson χ^2 statistic for categorical variables and *t* test for continuous measures. A 95% CI was calculated for some of the answers with continuous data. For major outcomes (mean scores in personal burnout and work-related burnout) that were continuous data, a normal distribution assumption was reasonable. Univariable data analysis (linear) by potential independent variables was performed, and associated variables with *P* value of <.15 in the univariable analysis were included in the multivariable linear regression model. Statistical significance was established at $P < .05$ (2-tailed). All analyses were performed in SAS software, version 9.4 (SAS Institute Inc).

RESULTS

The survey was first made available on October 20, 2021, and closed on December 31, 2021. A total of 403 participants answered at least parts of the survey. The age distribution of the participants is shown in Figure 1, with fairly even distribution between ages 30 and 65 years. The majority of the participants self-identified as "white" (267 of 396, 69.2%), followed by "Asian" and "Hispanic or Latino" (54 of 396 [14.0%] and 21 of 396 [5.4%], respectively) (Table 1). Work-related demographic characteristics are presented in Table 2.

On average, the participants reported having completed their last year of training 19.0 ± 12.3 years ago (minimum, maximum, and median of 0, 50, and 18.5 years, respec-

TABLE 6. Univariable Analysis of Demographic Factors in Personal Burnout Scores Among Ophthalmologists

Parameter	Estimates	Standard Error	*T* Value	*P* Value	Levels	
Age, y	>18-30	32.2	9.23	3.49	<.0001[a]	10 levels; >70 y (reference), >18-30 y, >30-35 y,… >65-70 y
	>30-35	24.5	6.30	3.88	.0006[a]	
	>35-40	26.8	6.43	4.17	<.0001[a]	
	>40-45	20.4	6.24	3.28	.0012[a]	
	>45-50	17.2	6.39	2.70	.0074[a]	
	>50-55	18.0	6.34	2.85	.0047[a]	
	>55-60	21.7	6.25	3.48	.0006[a]	
	>60-65	4.87	6.37	0.76	.4451	
	>65-70	4.89	6.96	0.70	.4828	
Practice focus	Practicing	−17.3	3.93	−4.40	<.0001[a]	3 levels: Trainee (reference), Practicing, Other
	Nonclinical	−20.0	8.52	−2.35	.0194[a]	
Practice type	Academic	0.280	2.36	0.120	.9074	2 levels: Nonacademic (reference), Academic
Subspecialty training	Anterior segment surgery	−6.35	2.82	−2.25	.0251[a]	5 levels: Pediatric ophthalmology (reference), Anterior segment surgery, Multiple fellowships, None, Other
	Multiple fellowships	−4.86	4.29	−1.13	.2577	
	None	5.17	3.90	1.33	.1860	
	Other	−5.86	3.14	−1.87	.0630	
Gender assigned at birth	Female	8.77	2.21	3.97	<.0001[a]	2 levels: male (reference), gemale
Sexual orientation	LGBTQ+	13.0	3.38	3.85	.0001[a]	2 levels: Non-LGBTQ+ (reference), LGBTQ+
Race/ethnicity	Asian	−0.850	3.29	−0.260	.7954	3 levels: White (reference), Asian, Other
	Other	2.93	2.90	1.01	.3130	
Caretaker stress at home	No	−9.88	2.42	−4.09	<.0001[a]	2 levels: Yes (reference), No
Years since training	For every additional year	−0.530	0.0900	−6.00	<.0001[a]	

tively). The majority (371 of 386, 96.1%) were working in an ophthalmology-related field, with the majority (360 of 403, 89.3%) self-described as "currently in clinical practice," whereas 23 (5.7%) were "in training, planning to have a clinical practice."

Geographic information was available from 393 of the 403 participants, the majority of whom were from the United States (283, 72.0%) and Canada (73, 18.6%), followed by Israel (24, 6.1%), Taiwan (4, 1.0%), and Saudi Arabia (3, 0.8%). One participant each was from the following countries: Albania (0.3%), Brazil (0.3%), Colombia (0.3%), Czech Republic (0.3%), Mexico (0.3%), and Turkey (0.3%).

Gender identity, gender role, and sexual orientation data were available for 386 of the 403 participants (Table 3). In total, 379 (98.2%) self-reported as a cisgender man (221, 57.3%) or a cisgender woman (158, 40.9%), whereas 7 (1.8%) self-reported as nonbinary and/or genderfluid (Table 3). In terms of sexual orientation, 335 (86.8%) identified as "non-LGBTQ+," and 32 (8.3%), 8 (2.1%), 5 (1.3%), 3 (0.8%), and 2 (0.5%) identified as "gay," "bisexual," "lesbian," "pansexual,"" and "queer/questioning," re-

TABLE 7. Multivariable Analysis of Demographic Factors in Personal Burnout Scores Among Ophthalmologists

Parameter		Estimate	Standard Error	*T* Value	*P* Value	Levels
Age, y	>18-30	19.6	16.1	1.22	.2241	10 levels; >70 y (reference), >18-30 y, >30-35 y,… >65-70 y
	>30-35	16.3	13.9	1.17	.2429	
	>35-40	23.8	13.0	1.83	.0675	
	>40-45	17.9	11.7	1.53	.1274	
	>45-50	14.4	10.6	1.36	.1759	
	>50-55	14.6	9.26	1.58	.1151	
	>55-60	19.1	7.98	2.39	.0173[a]	
	>60-65	5.06	7.29	0.690	.4881	
	>65-70	4.25	7.10	0.600	.5497	
Practice focus	Practicing	−16.6	8.39	−1.98	.0489[a]	3 levels: Trainee (reference), Practicing, Other
	Nonclinical	−11.1	4.68	−2.36	.0190[a]	
Subspecialty training	Anterior segment surgery	−4.07	2.64	−1.54	.1244	5 levels: Pediatric ophthalmology (reference), Anterior segment surgery, Multiple fellowships, None, Other
	Multiple fellowships	−1.55	4.05	−0.380	.7024	
	None	1.92	3.99	0.480	.6297	
	Other	−3.32	2.98	−1.12	.2654	
Gender assigned at birth	Female	5.36	2.20	2.44	.0153[a]	2 levels: Male (reference), Female
Sexual orientation	LGBTQ+	11.8	3.33	3.54	.0005[a]	2 levels: Non-LGBTQ+ (reference), LGBTQ+
Caretaker stress at home	No	−6.42	2.43	−2.65	.0085[a]	2 levels: Yes (reference), No
Years since training	For every additional year	0.0900	0.310	0.290	.7682	

spectively. No participant identified as "asexual." A larger proportion of LGBTQ+ participants (7 of 47, 14.9%, compared to 24 of 333, 7.2%, of non-LGBTQ+ participants, $P = .385$) were in training, and LGBTQ+ participants had fewer years since training (11.4 ± 11.6 years vs 19.1 ± 12.7 years, $P = .0001$) compared to non-LGBTQ+ participants. There were no significant differences in the proportion of individuals working in academic vs non-academic institutions between non-LGBTQ+ and LGBTQ+ participants (Table 4).

The majority of participants self-reported as being "in a monogamous relationship" or "single" (332 and 34 of 386, 86.0% and 8.8%, respectively), whereas the remainder were "in a non-monogamous relationship" (12 of 386, 3.1%) or "other" (8 of 386, 2.1%). The majority of participants (278 of 386, 72.0%) did not have significant stress from being the main caretaker of young children or other family members at home (Table 1).

On average, the participants worked 48.0 ± 13.4 hours per week, interacted daily with 15.3 ± 13.6 coworkers, of whom an estimated 10.5% were LGBTQ+. Of 351 who responded; 41 (11.7%) either had witnessed or had become aware of microaggressions, discrimination, abuse (physical and/or verbal), or harassment at the workplace related to the participant's own or a coworker's LGBTQ+ sexual orientation.

The overall mean (SD) personal and work-related burnout scores were 44.7 (20.7) and 39.4 (21.9), respectively. In comparison, the Copenhagen Burnout Inventory validation study outcomes, which included 1914 randomly sampled respondents across 7 different work environments in the Danish general population, had mean (SD) personal and work-related burnout scores of 35.9 (16.5) and 33.0 (17.7), respectively.[61] Our cohort of ophthalmologist participants had higher scores in both personal and work-related burnout compared to those of the Danish general

TABLE 8. Univariable Analysis of Demographic Factors in Work-Related Burnout Scores Among Ophthalmologists

Parameter		Estimates	Standard Error	*T* Value	*P* Value	Levels
Age, y	>18-30	30.2	9.83	3.07	.0023[a]	10 levels; >70 y (reference), >18-30 y, >30-35 y,… >65-70 y
	>30-35	26.8	6.72	3.99	<.0001[a]	
	>35-40	30.7	6.84	4.48	<.0001[a]	
	>40-45	24.2	6.64	3.64	.0003[a]	
	>45-50	27.0	6.80	3.97	<.0001[a]	
	>50-55	21.3	6.75	3.15	.0018[a]	
	>55-60	24.9	6.66	3.74	.0002[a]	
	>60-65	10.9	6.78	1.60	.1099	
	>65-70	9.69	7.42	1.31	.1925	
Practice focus	Practicing	–13.4	4.18	–3.20	.0015[a]	3 levels: Trainee (reference), Practicing, Other
	Nonclinical	–6.58	9.06	–0.730	.4682	
Practice type	Academic	2.73	2.48	1.10	.2717	2 levels: Nonacademic (reference), Academic
Subspecialty training	Anterior segment surgery	–5.49	2.98	–1.84	.0664	5 levels: Pediatric ophthalmology (reference), Anterior segment surgery, Multiple fellowships, None, Other
	Multiple fellowships	–4.91	4.53	–1.08	.2791	
	None	5.58	4.12	1.35	.1769	
	Other	–2.21	3.32	–0.66	.5069	
Gender assigned at birth	Female	7.66	2.34	3.28	.0011[a]	2 levels: Male (reference), Female
Sexual orientation	LGBTQ+	12.6	3.56	3.53	.0005[a]	2 levels: Non-LGBTQ+ (reference), LGBTQ+
Race/ethnicity	Asian	–1.07	3.46	–0.31	.7574	3 levels: White (reference), Asian, Other
	Other	1.34	3.04	0.440	.6590	
Caretaker stress at home	No	–9.31	2.55	–3.65	.0003[a]	2 levels: Yes (reference), No
Years since training	For every additional year	–0.52	0.09	–5.55	<.0001[a]	

population sample ($P < .0001$ for both). Compared to the other medical specialties (based on a study from the United Kingdom), in personal burnout, there were no significant differences between our ophthalmology cohort and emergency medicine (mean = 50.0, SD = 14.4, $P = .0741$), acute medicine (mean = 51.1, SD = 15.3, $P = .0701$), or trauma/orthopedics (mean = 43.4, SD = 17.6, $P = .1108$), although our cohort had lower personal burnout compared to general surgery (mean = 57.4, SD = 14.3, $P = .0053$).[7] In work-related burnout, our cohort had a significantly lower score than did emergency medicine (mean = 53.5, SD = 13.1, $P < .0001$), acute medicine (mean = 52.6, SD = 12.9, $P = .0004$), and general surgery (mean = 55.9, SD = 13.5, $P = .0053$) but not significantly different from trauma/orthopedics (mean = 46.2, SD = 12.3, $P = .1108$).[7]

The personal and work-related burnout scores and 95% confidence limits of those who identified as "LGBTQ+" were higher and non-overlapping compared to those of respondents who reported being "non-LGBTQ+." In personal burnout, the mean (lower, upper 95% confidence limit [CL]) for LGBTQ+ respondents was 55.7 (50.1, 61.3), whereas that for non-LGBTQ+ respondents was 43.1, (40.8, 45.4). Similarly, in work-related burnout, the mean (lower, upper 95% CL) for LGBTQ+ respondents was 49.8 (43.1, 56.5), whereas the mean for non-LGBTQ+ respondents was 37.7(35.5, 40.3) (Table 5). This finding supports

TABLE 9. Multivariable Analysis of Demographic Factors in Work-Related Burnout Scores Among Ophthalmologists

Parameter		Estimates	Standard Error	*T* Value	*P* Value	Levels
Age, y	>18-30	10.4	17.4	0.600	.5501	10 levels; >70 y (reference), >18-30 y, >30-35 y,… >65-70 y
	>30-35	12.5	15.1	0.830	.4091	
	>35-40	21.6	14.0	1.54	.1247	
	>40-45	15.9	12.7	1.25	.2106	
	>45-50	19.3	11.5	1.68	.0935	
	>50-55	13.8	10.0	1.37	.1705	
	>55-60	19.2	8.64	2.22	.0273[a]	
	>60-65	8.04	7.90	1.02	.3096	
	>65-70	6.99	7.69	0.910	.3644	
Practice focus	Practicing	–8.05	5.07	–1.59	.1135	3 levels: Trainee (reference), Practicing, Other
	Nonclinical	–3.46	9.08	–0.380	.7035	
Subspecialty training	Anterior segment surgery	–3.32	2.86	–1.16	.2468	5 levels: Pediatric ophthalmology (reference), Anterior segment surgery, Multiple fellowships, None, Other
	Multiple fellowships	–2.42	4.39	–0.550	.5811	
	None	4.73	4.32	1.09	.2747	
	Other	–0.270	3.23	–0.0900	.9322	
Gender assigned at birth	Female	4.83	2.38	2.03	.0434[a]	2 levels: Male (reference), Female
Sexual orientation	LGBTQ+	11.1	3.61	3.07	.0023[a]	2 levels: Non-LGBTQ+ (reference), LGBTQ+
Caretaker stress at home	No	–5.97	2.63	–2.27	.0239[a]	2 levels: Yes (reference), No
Years since training	For every additional year	–0.0700	0.330	–0.220	.8274	

our hypothesis of LGBTQ+ orientation being a burnout risk factor among ophthalmologists.

A total of 380 participants completed the entire survey, which allowed analyses of the association of demographic factors with burnout scores. Univariable analysis was performed to assess association of the various demographic factors with both person- and work-related burnout scores (Tables 6 and 8). In the multivariable analyses, factors significantly associated with personal burnout score were as follows: age >55 to 60 years (increased burnout compared to age 70+ years, 19.1), being a non-trainee (decreased burnout compared to trainees, −16.6 for practicing and −11.1 for nonclinical ophthalmologists), female gender (increased burnout compared to male gender, 5.36), being LGBTQ+ (increased burnout compared to being non-LGBTQ+, 11.8), and absence of self-reported caretaker stress at home (decreased burnout, −6.42) (Table 7). Factors significantly associated with the work-related burnout score were as follows: age >55 to 60 years (increased burnout compared to age 70+ years, 19.2), female gender (increased burnout compared to male gender, 4.83), being LGBTQ+ (increased burnout compared to being non-LGBTQ+, 11.1), and absence of self-reported caretaker stress at home (decreased burnout, −5.97) (Table 9).

For the question "What more can professional societies do to increase/maintain diversity and inclusion in ophthalmology," there were 189 responses. After omitting ones that offered no information (eg, "I don't know," "Not sure," "NA," 47 total), 142 responses were listed in order of word count in Table 10 (with identifying information, such as location or institution names, redacted). There were several suggestions for professional societies to have resources (anonymous phone lines, complaint systems) to help their members deal with perceived workplace discrimination. Several suggested that professional societies lobby against state laws that discriminate against LGBTQ+ individuals

TABLE 10. Free Text Responses (Arranged by Word Count) to the Question "What More Can Professional Societies Do to Increase/Maintain Diversity and Inclusion in Ophthalmology?"

I don't think diversity necessarily grows from the top down. So it depends what the role of professional societies is. My best guess is that the role of promoting professional and acceptable standards of care should not be conflated with and has nothing to do with doctors' personal choices about who they choose to spend their time with and how. Unless it is specifically a LBTQ society perhaps, but that risks undermining itself just by existing, as if it is something unusual. But then the same could be said for a women in ophthalmology group, and that exists in a way that seems exclusionary to men, so maybe the world we live in just ain't perfect. Peace and love.

- They need to have a complaint system to address open discrimination against the transgender physicians, especially transgender females who have a greater struggle being passable. Also, we support groups created to guide each other or mentor those freshly coming out. For me, to get the proper attention of the (redacted institution name) regarding name change and bathroom usage, I found it helpful to speak to the legal counsel of the hospital. For the pharmacy issue, where they associate my NPI number to my [former] name, I have to file complaints at the (redacted name) Pharmacy Board, to properly get their attention. The list goes on. Certainly the American Board of Ophthalmology was clueless about a gender marker change.
- Allow anyone who wants to apply to ophthalmology the opportunity to do so. In other words don't promote one group over another in the name of diversity or arbitrary quotas just because someone thinks they are making the world more "fair." For instance, why are ophthalmologists so tall? We should strive to allow more short humans into ophthalmology in order to be more inclusive because we have nothing better to do and each generation needs a cause to fight for I guess.
- Stress the importance of non-biased interviews by residency directors/faculty. people's biases may be subtle, but I have seen qualified people not be chosen for residency (at least partly) because they were a less attractive/overweight female, a white male whose wife had cancer, people who were just "less cool". It is difficult to control, residency decisions can be arbitrary and subjective. Professional societies could have residency selection committees do exercises to discover their own underlying biases.
- Provide resources to bring training into private practice. I brought this issue to my partners (1 woman, 8 men) and was basically told that if diversity and inclusion was important to me, I would personally need to do the training. When I mentioned that I don't have that expertise, I was told "neither do we" and we don't have the interest in pursuing.
- Ignore it completely. In other words include people who are qualified and talented and completely ignore their orientation to race religion or choice of sexual partners. This has no place whatsoever in the workplace. Show up do your job and don't worry about who is poking whom with what. These are private issues and should not be discussed in professional life.
- It's not an issue for many of us in dense urban areas, where lgbtq persons are easily integrated in diverse, well-educated offices. But perhaps societies could have a confidential "Diversity Question Phone Line" where some of our colleagues who are not as comfortable with racial, ethnic, gender issues can confidentially ask questions about how best to handle issues of concern would benefit everyone.
- I think enough is being done already. It will be a very slow process. Be patient and don't overstep the boundaries of reasonableness. Assume people are good and not interested in harming others rather than the opposite. Be careful about social medias influence. It enables people to skew the conversation away from the center. Thanks for the survey.
- Actively lobby against state laws that aim to hinder diversity and promote racist ideas (such as some current election laws). Until society (and those with political and social power) understand its importance, we can't expect professional societies to take it seriously. Could start by actively avoid promoting or hosting events at locations with racist and LGBT-abusive policies.
- Unfortunately, my answer is for people to stop talking about it and just be better. For example, we got justice and a conviction in Georgia for killing a black man, who was only killed because he was black, by not talking about race during the trial and focusing simply on the injustice.
- Ask each member to reflect. Recognizing bias is a huge step toward addressing it. Mandated diversity is counterproductive. Self-selected diversity results in strength and improved performance. This occurs when the individuals, through reflection, take action to view and interact with others differently.
- Professional societies need to be more devoted to stopping reimbursement cuts and minimizing administrative burdens (i.e., MIPS). They are responsible for 95% of ophthalmology burn out. Shame on the AAO and big-name academic medicine for past 20 years!!
- Impose a limit on how long surveys can be and what questions they ask. Sorry but I do not think this survey is appropriate. Also it is trying to obtain too much information on too many topics.
- Stop putting people on panels on the basis of who they know. There is way too much of this in medicine. No equal opportunity truly exists when it comes to representation on the national circuit.
- Create a visible part of aapos that people can join and participate in to support LGBQTI individuals and their supporters. The Queer Eye Ball, now that's one event this straight male ophthalmologist would go to!
- Increase diversity in leadership, speaker panels, and award winners; the main professional society I'm in has primarily men in leadership and among award winners (even for early career awards) despite very deserving women.
- Stop focusing on "diversity and inclusion" which only divides and "others" people. Instead, focus on treating everyone with respect as colleagues, regardless of their immutable characteristics, or what they so in their spare time.
- have more diverse leadership of societies (now and developing a pipeline of diverse leaders).Deliberately state a policy of acceptance of diversity and inclusion. Advocate for universal preschool for all children.

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TABLE 10. (*continued*)

I don't think diversity necessarily grows from the top down. So it depends what the role of professional societies is. My best guess is that the role of promoting professional and acceptable standards of care should not be conflated with and has nothing to do with doctors' personal choices about who they choose to spend their time with and how. Unless it is specifically a LBTQ society perhaps, but that risks undermining itself just by existing, as if it is something unusual. But then the same could be said for a women in ophthalmology group, and that exists in a way that seems exclusionary to men, so maybe the world we live in just ain't perfect. Peace and love.
• I am a woman and I don't feel like I've faced major discrimination despite starting when there were not that many women surgeons. You work hard and good things happen.
• Recognize competence and accomplishment first and foremost, educate about " measures of success" from perspective of diversity and how to incorporate those in evaluation, bring " EDI "lens to policy decisions itself. The best way to improve DEI is to not talk about it directly, because when you do, you alienate the other side immediately and they close their minds.
• The process starts at kindergarten and preschool. Most of the interventions I see are working with the very small fraction of URM candidates that make it to med school.
• In panel discussions, include people of different age, gender, ethnicities, sexual orientations. There are lots of panels with older, white men. Nothing against them, just homogeneous.
• stop making an issue of it. Just treat everyone the same and stop making our organizations woke. And address the gender pay inequality issue in medicine first.
• As individuals we can provide mentoring opportunities to all, and women and minorities who are interested and become qualified will be empowered.
• Recruit diverse people into residencies. This starts with recruiting medical students at an early stage so that they will consider pursuing ophthalmology.
• Create opportunities for people with different identities to shine rather than fit in a mold. Assess data, be accountable, take bold actions.
• Treat each other as the professionals we are and should be. It is not about the caregiver but about how we interact to achieve great care for all our patients.
• Would also tackle gender disparities in the field as there are many examples of gender inequality biased towards males.
• Take a very careful look at who is on panels, etc. at meetings and who selects residents and fellows.
• treat EVERYONE with equal respect regardless of labels. See the person and not the group to which they belong.
• Increase awareness and people need to be open. AAPOS is very conservative IMO. Not sure how they will respond.
• Increase awareness of ophthalmology at an earlier stage in medical training to increase awareness and interest in the field.
• Not ask about it all the time; people earn respect and therefore there continues to be diversity.
• Awareness and education, emphasize true value of diversity- not just diversity because it looks good for an organization.
• Shift focus away from group difference and grievance, and toward universal tolerance, acceptance, and recognition of individual character.
• Recruit support help us advocate locally and nationally help us get data to help us advocate for ourselves.
• Diversity is a goal achieved by creating opportunity for all. Diversity is the result of broader opportunity.
• Nothing. People should be hired on the basis of their qualifications. Gender/race/religion etc. should not be considered.
• Lesson the burden of MOC/recredentialling. Get rid of the high stakes quarterly question requirement. For ophthalmologist board-certified bypassing the written and oral boards and your CME should suffice for recredentialing.
• Consider incorporating lectures or open discussions about gender disparity among physicians and how to deal with it.
• Promote quotas, provide leadership and research funding specifically for minorities, profile minorities in the public media.
• Educational programs/symposia at meetings, members in our ophthalmology community publicly sharing personal experiences with our field.
• We are doing enough. We should focus more on academics and medical knowledge at meetings.
• Speak of including all diverse people but do it without stressing the difference in people.
• Express explicitly that all members will be treated equally and warmly regardless of their diversity.
• Recognize, acknowledge and actively work through open conversation and action to improve the status quo.
• Believe and act on the fact that every person is beautifully and wonderfully made.
• outreach to these communities in high school and college, to spark interest before professional/graduate school.
• Discuss genetics more rather than using race as a proxy for genetic diversity.
• I don't believe anything needs to be done. This is a non-issue.
• Ensure representation but don't go to token representation and show ID that token representation.
• Tough one; needs to start at medical school or high school.
• Surveys such as this and in person meetings at major annual meetings.
• Bring up these topics. more articles such as this in continuing education.
• Recruitment at younger point in training with diverse mentorship and diverse leadership.
• Social events and meet and greets like at AAO this year.

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TABLE 10. (*continued*)

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- Increase diversity and inclusion by all races, gender choice, ethnicity, etc.
- Reward with leadership to those members who are under represented–LGBTQA.
- Nationally recognized interest groups; more national visibility; advocate for wellness and tolerance.
- The more you amplify it, the more you divide people apart.
- Have more women and new people speaking at the podium.
- Dialogue. Inclusiveness. Encouragement to join the "cis white boys club."
- Recruit more LGBT trainees, advertise when jobs are LGBT friendly.
- Be inclusive and educate a very conservative group of people.
- Tackle figuring out how to make maternity leave work better.
- Give more recognition/visibility to LGBTQ membership. Give us a voice.
- Agree that race, ethnicity and orientation not be an issue.
- Put their LGBTQ members on the podium at national meetings.
- Use a more holistic approach when selecting residents and fellows.
- Actively promote diversity in all aspects of professional life.
- I believe that we are doing an excellent job.
- They are working in the right direction, slow process.
- More open research and public surveys on the topic.
- Encourage discussion of diversity related issues in training programs.
- Select the MOST qualified applicants for training and employment.
- Increase awareness of the diversity among our community today.
- Only way is to recruit more diverse medical students.
- Make significant commitments to diversity at a grassroots level.
- Limit diversity to "physical "love" of children" like NAMBLA.
- Reach out to diverse communities to attract candidates early.
- Courses on work life balance in non-traditional relationships.
- Encourage an open minded attitude to all people.
- Be fair to everyone and treat everybody equally.
- Make everyone more aware of issues/situations. More education.
- Have more women, minority and LGBTQ+ decision makers.
- Address it head on starting in medical school.
- Collect data on race, ethnicity, gender, sexual orientation.
- Have a diversity officer and a diversity committee.
- Not an issue that I have seen.
- Visible role models at high AAPOS positions.
- Outreach as medical students to generate interest.
- Not make an issue of it!
- Nothing that I can think of.
- Take people in of differing backgrounds.
- Ensure diversity on panels, selection/planning committees.
- Accept people for who they are.
- Create, support, and normalize part-time work.
- More discussion of LGBTQ and diversity.
- Have a diverse board of directors.
- Just be good to people.
- Improved methodology of recruiting, hiring.
- Problem is distribution not support.
- Hire more openly gay staff/residents.
- Talk about these issues more.
- Keep bringing up the topic.

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TABLE 10. (*continued*)

I don't think diversity necessarily grows from the top down. So it depends what the role of professional societies is. My best guess is that the role of promoting professional and acceptable standards of care should not be conflated with and has nothing to do with doctors' personal choices about who they choose to spend their time with and how. Unless it is specifically a LBTQ society perhaps, but that risks undermining itself just by existing, as if it is something unusual. But then the same could be said for a women in ophthalmology group, and that exists in a way that seems exclusionary to men, so maybe the world we live in just ain't perfect. Peace and love.
• Try to recruit more minorities.
• Encourage diversity in fellowship training.
• Have more activities for seniors.
• This is a great survey.
• Acknowledge that there is diversity.
• Deliberately recruit them into residency.
• Develop a Diversity Strategic Plan.
• Talk less about it.
• Forced diversity/inclusion is unnecessary.
• Put LGBTQ flag visible.
• Never thought about it.
• Community events, support groups.
• Accept more minority groups.
• Keep talking about it.
• Equal pay and promotion.
• Increase awareness and representation.
• Mentoring, subspecialty focus groups.
• Be supportive of all.
• Rely on colorblind merit.
• Doing a good job.
• Cognitive bias training.
• Look beyond sexuality.
• Continue the conversation.
• Reprimand abusive staff.
• Pipeline is key.
• Training for everyone.
• Better mentorship.
• Start the conversation.
• More discussion.
• Be encouraging.
• Social/networking events.
• Education.
• Educación.

and avoid hosting society meetings in cities/states/countries with anti-LGBTQ+ laws. A subset (14 of 142, 9.9%) stated that no further actions were necessary, and these mainly fall into one of 2 groups: some believed that deliberately drawing attention to LGBTQ+ and other diversity issues would be divisive and counterproductive, whereas others simply stated that a lack of diversity and inclusion in ophthalmology wass not an issue. Finally, there were 2 comments that may be interpreted as a protest against this survey. One participant "[does] not think the survey was appropriate," although there were no details on whether the comment was directed at the survey format, content, or both. Another participant wrote "limit diversity to physical 'love' of 'children; like NAMBLA,' " possibly drawing a parallel between LGBTQ+ sexual orientation with pedophilia and other sexual paraphilia in a poor attempt at humor, sarcasm, or to offend (NAMBLA is likely the acronym of North American Man/Boy Love Association, which advocates for pedophilia; https://en.wikipedia.org/wiki/North_American_Man/Boy_Love_Association).

DISCUSSION

As the world's population ages, the demands on healthcare institutions will increase significantly.[65-69] In ophthalmology, the demand is estimated to increase between 40% and 90% by 2040, and several models have predicted a workforce shortage.[70-74] Burnout is a significant contributor of

physician work hour reduction and early retirement, which exacerbates the predicted physician shortage.[1,75-78] Thus, to maintain a sustainable healthcare workforce to meet the demands in coming decades, mitigating and reducing physician burnout by identifying modifiable risk factors is a professional priority.

In our international study cohort, 13.2% of ophthalmologists identified as LGBTQ+, and LGBTQ+ healthcare workers make up an estimated 10.5% of the workforce. This is the first estimate of the proportion of LGBTQ+ physicians in ophthalmology. Several recent findings provide the context for this estimation. First, a recent survey showed that approximately 15% of American medical students identify as LGBTQ+, 29.5% of whom concealed their sexual orientation, partly out of "fear of discrimination in medical school."[79-81] Second, ophthalmology is 1 of the least chosen fields by LGBTQ+ medical students, possibly because of low visibility of "out" LGBTQ+ physicians.[82,83] Taken together, given the potentially larger proportion of LGBTQ+ medical students and the high rate of nondisclosure, the true proportion of LGBTQ+ physicians in ophthalmology may be significantly higher than our estimates indicate. However, it is encouraging that the proportion of the workforce who identify as LGBTQ+ approaches the proportion of medical students, which suggests a fair representation, in contrast to other minority groups such as women (53.7% of medical students, 39% of clinical faculty).[84] Although 98.19% of the cohort identify as cisgender women or men, 1.81% identify as nonbinary and/or genderfluid, which is consistent with prior population estimates (https://www.statista.com/statistics/1269778/gender-identity-worldwide-country/).[85-87]

The multivariable analyses identified several independent factors associated with significantly higher scores for both personal and work-related burnout: being LGBTQ+ (compared to non-LGBTQ+), female (compared to male), having caretaker stress at home (compared to its absence), and being >55 to 60 years of age (compared to 70+ years of age). This is the first study to demonstrate LGBTQ+ orientation as a risk factor for both personal and work-related burnout in ophthalmology. As outlined previously, there are likely both internal and external factors contributing to burnout for a LGBTQ+ physician, including the psychological stress of disclosure and workplace discrimination.[45-54] Regarding the latter, 11.7% of the study cohort either had witnessed or had become aware of microaggressions, discrimination, abuse, or harassment related to LGBTQ+ orientation in the work place. In addition, a prior study suggested that LGBTQ+ employees receiving the least institutional support reported the most orientation-specific harassment and burnout.[88] Thus, effective organizational responses through formal policies and practices that build supportive work climates may reduce LGBTQ+-related burnout by reducing workplace discrimination.[89,90] Interestingly, being in training (as opposed to being in practice) is a risk factor for higher personal but not work-related burnout scores. The association of being a trainee and higher work-related burnout was significant in univariable but not in multivariable analysis. It is likely that caretaker stress may have confounded trainee status (unlike being a trainee, other factors such as being LGBTQ+ and female are not dynamic, intermittent states; being aged >55-60 years of age is unlikely to confound trainee status as a risk factor for burnout) in work-related burnout.

Although being female and having caretaker stress at home are well-established burnout risk factors,[1,13,43,44,56,91] our data suggest that being female is a significant risk factor independent of caretaker stress among ophthalmologists. Prior studies suggested workplace discrimination being a likely contributor.[92-94] In contrast to prior studies, being older, instead of younger, was significantly associated with higher burnout in the study cohort. Although the cause of this observation remains uncertain, the aging ophthalmologist faces several challenges that may increase the stressors that contribute to both personal and work-related burnout. Internally, age-related changes in both cognitive and neuromuscular function may have a negative impact on a surgeon's attitude and comfort level toward surgical work and electronic medical record use, which in turn indirectly increase work-related psychological stress.[95-99] Externally, age-related discrimination against senior physicians is prevalent, which may also contribute to greater burnout in our cohort >55 to 60 years of age.[100,101] Although our survey did not find race/ethnicity to be significantly associated with burnout, our sample is likely skewed with an overrepresentation of Whites and Asians, with only 16.8% reporting being "other." This sample is likely underpowered for detecting the effect of race/ethnicity on ophthalmologist burnout.

The relative and additive effects of these risk factors are worth noting. Specifically, for both personal and work-related burnout, being LGBTQ+ (an increase of 11.8 and 11.1 over non-LGBTQ+ participants, respectively) is similar to being both female (an increase of 5.36 and 4.83 over male participants) and having caretaker stressors at home (an increase of 6.42 and 5.97; total increase of 11.8 and 10.8, respectively), yet these risk factors have relatively small effects when compared to being >55 to 50 years of age (an increase of 19.1 and 19.2 over those 70+ years of age, respectively). As the prevalence of LGBTQ+ parenthood increases (https://www.familyequality.org/resources/facts-about-lgbtq-families/), the proportion of women in medicine increases, and the healthcare workforce ages,[102-104] the proportion of ophthalmologists with multiple risk factors (and thus particularly vulnerable to burnout), for example, female and/or senior LGBTQ+ physicians and LGBTQ+ physicians with caretaker stressors at home, may increase disproportionately. These findings and trends further emphasize the importance of organizational interventions that address discrimination related to LGBTQ+, sexism, and ageism and institutional support that decrease and mitigate caretaker stress.

Formulating strategies to devise effective policies at the organizational level is beyond the scope of this thesis. However, we observe several trends from the cohort's comments (Table 10). Forming nationally recognized interest groups like Women in Ophthalmology (https://www.wioonline.org/) may be effective in raising awareness of LGBTQ+-related burnout. Some have suggested having support/information resources, and both a formal and informal voice system that may serve to inform when discriminatory actions occur. Education has been widely advocated to reduce inequality in medicine and to bring awareness, especially given that approximately 12% of those who commented did not perceive the lack of inclusion as a significant issue in ophthalmology.[105-108] Several studies demonstrated overall negative effects of anti-LGBTQ+ legislation on mental well-being: individuals who lived in states in which gay marriage was banned had increased prevalence of psychiatric comorbidity compared to those living in places where there was no gay marriage ban.[109-112] Thus, for professional societies, advocacy efforts to promote LGBTQ+ inclusion legislation and LGBTQ+-friendly locations for society meetings may decrease burnout.

Our study has several limitations. First, as with all voluntary survey studies, ophthalmologists with more burnout symptoms and those who are LGBTQ+ may be more motivated to participate, resulting in sampling bias. However, because the survey title ("Work Place Diversity") was not immediately indicative of its LGBTQ+ or burnout content, and because, of 403 total respondents, 380 (94.3%) completed the survey in its entirety, this selection bias is less likely. Second, we were not able to include questions to assess "client-related burnout," which is the third domain of the CBI, as inclusion of additional question would increase the survey length/duration and lower the overall response rate. Third, many other work-related factors that may contribute to burnout, such as documentation burden and on-call frequencies, were not assessed because of the constraints of survey length, although there was no reason to suspect that these would differ significantly between LGBTQ+ and non-LGBTQ+ ophthalmologists. Fourth, ophthalmologists with a practice focus in pediatric ophthalmology, glaucoma, and comprehensive ophthalmology comprised approximately 90% of our cohort (Table 2). Despite "Subspecialty Training" not being a risk factor for an increase in either personal or work-related burnout scores (Tables 6–9), we cannot discount the under-representation of retina specialists, corneal specialists, and other subspecialists masking a subtle, subspecialty-specific effect. Finally, despite our efforts to engage the international ophthalmic community, countries in North America were overwhelmingly represented, and we cannot generalize our findings to regions such as Central/South America, Africa, the Middle East, and Asia. The reluctance of some regional ophthalmic societies to participate is not well understood, although LGBTQ+ topics being a cultural taboo and/or illegal are likely major factors.

In conclusion, LGBTQ+ orientation is associated with increased person and work-related burnout among ophthalmologists. As physician burnout garners public attention and its prevalence reaches new heights, and as more adults (and patients) now identify as LGBTQ+ than in previous years,[113] the collective efforts to ensure a robust and sustainable ophthalmology workforce would be well-served by promoting LGBTQ+ inclusion and advocacy. In addition, gender- and age-related discriminations also contribute significantly to ophthalmologist burnout. Future studies on the longitudinal effect of burnout risk factors, and the effects of organizational policy interventions, may yield new insights.

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