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### Authors

Afonso, Anoushka

Cadwell, Joshua

Staffa, Steven

et al.

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## U.S. Attending Anesthesiologist Burnout in the Post-Pandemic Era

Anoushka M. Afonso, MD<sup>1</sup>, Joshua B. Cadwell, MD, MBA<sup>1</sup>, Steven J. Staffa, MS<sup>2</sup>, Jina L. Sinskey, MD<sup>3</sup>, Amy E. Vinson, MD<sup>2</sup>

<sup>1</sup>Department of Anesthesiology & Critical Care, Memorial Sloan Kettering Cancer Center, New York, NY

<sup>2</sup>Department of Anesthesiology, Boston Children's Hospital, Harvard Medical School, Boston, MA

<sup>3</sup>Department of Anesthesia and Perioperative Care, University of California, San Francisco, San Francisco, CA

### Abstract

**Background:** Anesthesiologists are experiencing unprecedented levels of workplace stress and staffing shortages. This analysis aims to assess how US attending anesthesiologist burnout changed since the onset of the coronavirus disease 2019 (COVID-19) pandemic and target well-being efforts.

**Methods:** We surveyed the American Society of Anesthesiologists' US attending anesthesiologist members in November 2022. Burnout was assessed using the Maslach Burnout Inventory Human Services Survey with additional questions relating to workplace/demographic factors. Burnout was categorized as high risk for burnout (exhibiting emotional exhaustion and/or depersonalization) or burnout syndrome (demonstrating all three burnout dimensions concurrently). The association of burnout with US attending anesthesiologist retention plans was analyzed and associated factors were identified.

**Results:** Of 24,680 individuals contacted, 2,698 (10.9%) completed the survey with 67.7% (1,827 of 2,698) at high risk for burnout and 18.9% (510 of 2,698) with burnout syndrome. Most (78.4%, n=2115) respondents have experienced recent staffing shortages, and many (36.0%, n=970) were likely to leave their job within the next two years. Those likely to leave their job in the next two years had higher prevalence of high risk for burnout (78.5% (760/970) vs. 55.7% (651/1169), p<0.001) and burnout syndrome (24.3% (236/970) vs. 13.3% (156/1169), p<0.001) compared to those unlikely to leave. On multivariable analysis, perceived lack of support at work (odds ratio, 9.2; 95% CI, 7.0 to 12.1), and staffing shortages (odds ratio, 1.96; 95% CI, 1.57 to 2.43) were most strongly associated with high risk for burnout. Perceived lack of support at

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**Corresponding Author:** Amy E. Vinson, MD, Assistant Professor of Anesthesiology, Boston Children's Hospital & Harvard Medical School, 300 Longwood Avenue – Bader 3, Boston, MA 02115, 617-355-7737, amy.vinson@childrens.harvard.edu.

**Conflicts of Interest:** Dr. Afonso has recently acted as a consultant Merck (Kenilworth, New Jersey). Dr. Vinson is the Chair of the American Society of Anesthesiologists' Committee on Physician Well-being, Dr. Sinskey is the Vice-Chair of said committee and Dr. Afonso is a committee member.

**Prior Presentations:** Not applicable – some data was presented by Dr. Champeau (ASA President) as part of a keynote address at the 2023 ASRA Spring Conference

work (odds ratio, 6.3; 95% CI, 3.81 to 10.4) was the factor most strongly associated with burnout syndrome.

**Conclusions:** Burnout is more prevalent in anesthesiology since early 2020, with workplace factors of perceived support and staffing being the predominant associated variables. Interventions focused on the drivers of burnout are needed to improve well-being among US attending anesthesiologists.

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## INTRODUCTION

Burnout is an occupational phenomenon pervasive in medicine characterized by emotional exhaustion, depersonalization, and a low sense of personal accomplishment.<sup>1-4</sup> The presence of burnout in physicians has detrimental effects on physician health and quality of life, provided quality of care, and the number of medical errors.<sup>5-8</sup> Addressing burnout is both a healthcare worker and patient safety issue.

Burnout was endemic in anesthesiology even before the coronavirus disease 2019 (COVID-19) pandemic. The first large-scale study on burnout among US American Society of Anesthesiologists (ASA; Schaumburg, IL) member attending anesthesiologists occurred in March 2020, immediately preceding the escalation of COVID-19. The analysis found that 59.2% of respondents reported at least one symptom of burnout syndrome, while 13.8% reported all three symptoms.<sup>9</sup> Since this initial study, the healthcare landscape has experienced a pandemic with myriad downstream effects. Throughout the pandemic, anesthesiologists were part of the front line of care for COVID-19 patients.<sup>10</sup> These unprecedented demands on the field were instrumental in caring for patients but placed profound stressors on anesthesiologists.<sup>11,12</sup> Evidence suggests the pandemic may have led to increased burnout prevalence in anesthesiologists as well as other mental health conditions such as post-traumatic stress disorder, anxiety, and depression.<sup>13,14</sup>

There was a relative shortage of US attending anesthesiologists prior to the COVID-19 pandemic, partially due to increased demand from the aging baby boomer generation,<sup>15</sup> which was previously associated with burnout in anesthesiologists.<sup>9</sup> As the COVID-19 pandemic has likely worsened anesthesiologist and anesthesia team member shortages, the impact that insufficient staffing has had on the field remains unclear.

This study aimed to quantify and assess changes in US ASA member attending anesthesiologist burnout since the onset of the COVID-19 pandemic, to identify risk factors associated with workplace burnout, and to identify interventions respondents perceived as most beneficial to address burnout. Our hypothesis was that the prevalence of burnout had increased since our last study conducted in March of 2020.

Our team conducted a nationwide study of US ASA member attending anesthesiologists. The survey was endorsed by the ASA Committee on Physician Well-Being and approved by the ASA Executive Committee before distribution. Both committees gave feedback on the study design, but neither were directly involved in the analysis, except for two authors currently serving as Chair and Vice Chair of the ASA Committee on Physician Well-Being.

## MATERIALS AND METHODS

This survey was exempted from full review and a waiver of informed consent was granted by the institutional review boards of Memorial Sloan Kettering Cancer Center (New York, NY) and Boston Children's Hospital (Boston, MA) in October 2022.

### Survey Participants

The ASA emailed invitations to participate in this voluntary survey to all attending anesthesiologist members in the US who opted in to receiving research surveys. The email outlined the goals of the survey, assured confidentiality and anonymity of responses, and contained a link to the 46-question survey instrument (appendix A). No incentives were offered for participation and no personal identifying information was collected or stored. Initial invitations were sent on November 5, 2022, with two follow-up reminders on November 11 and 19, 2022.

### Survey Questionnaire

The survey for this analysis was adapted from the initial burnout survey (appendix B) on US attending anesthesiologists in 2020.<sup>9</sup> The survey was updated to gather more information on workplace factors as these were found to be most highly associated with burnout in the original study. Questions removed from the 2020 survey included 2 and 7. Questions added to the 2022 survey included 2, 3, 11–14, 42, 43, and 46. The MBI-HSS is a standard questionnaire and was not amended. Question 1 from both surveys (practice settings) was expanded in the 2022 survey to incorporate more practice options, but given editorial and reviewer concerns regarding this question, it was removed from analysis post hoc. Questions utilized in this open survey were prepared based on guidance from the American Association for Public Opinion Research (Lenexa, Kansas)<sup>16</sup> and CHERRIES checklist to ensure all relevant items are reported.<sup>17</sup>

Participants were asked to provide information on primary practice environment, geographic location, subspecialty of practice, length of time since completing training, average weekly hours worked, recent staffing shortages, level of support in their professional and personal lives, magnitude of caregiving responsibilities, the impact of the pandemic on retirement timelines, plans to leave their current job or change their full-time status, and their opinions of offered beneficial changes to their workplace environment. Further, participants were asked to optionally provide information on their demographics, including age, gender identity, racial identity, and inclusion in vulnerable or underrepresented groups in anesthesiology. The survey questions were designed based on significant predictors in our prior burnout study<sup>9</sup> and after review of the burnout literature in the years since the onset of the pandemic through Medline (PubMed) in Oct 2022 using subject headers and keywords related to anesthesiology and burnout using subject headers and mesh terms. Our literature search was done with the assistance of a Research Informationist through the Memorial Sloan Kettering Cancer Center (MSK) Library-Technology Division.

Burnout metrics were assessed using the 22-question Maslach Burnout Inventory Human Services Survey.<sup>2</sup> This proprietary survey is the gold-standard metric for assessing physician

burnout and has been repeatedly validated in the literature.<sup>9,18,19</sup> The questionnaire assesses the three domains of burnout, including emotional exhaustion, depersonalization, and feelings of personal accomplishment. Each item utilizes a 7-level Likert scale ranging from *never* to *every day*. Although the Maslach Burnout Inventory Human Services Survey defines burnout over a continuum, in line with previous studies on burnout in US physicians, we considered a high score on emotional exhaustion (greater than or equal to 27) and/or depersonalization (greater than or equal to 10) to identify those at high risk for burnout.<sup>18,20</sup> Those identified to have burnout syndrome had a high score on emotional exhaustion and depersonalization alongside a low score on the sense of personal accomplishment (less than or equal to 33; i.e., all three dimensions present concurrently using the scoring thresholds above) [Figure 1]. This definition was utilized in the most recent study on burnout in US attending anesthesiologists and is consistent with those published by the World Health Organization and Maslach et al.<sup>1,2,9</sup> Web-based responses were captured automatically into SurveyMonkey (<http://www.surveymonkey.com>) for further analyses without any participant identifiers. Unique site visitor was captured based on IP addresses.

The questions were modified following input received by ASA Committee on Physician Well-Being members. The ASA Executive Committee approved the final survey before distribution to US attending anesthesiologist ASA members. The authors and a small group of professional colleagues and staff completed pretesting of the survey instrument, including online desktop and mobile interface, usability, and functionality. All responses from this testing were erased before survey distribution to the ASA membership and not incorporated into the results. Questions were presented in a force-response format except for the demographics section, which was made optional in order to maximize perceived anonymity by the respondent.

### Statistical Analysis

A data analysis and statistical plan was written after the data were accessed, in a manner similar to the analysis conducted in 2020. Descriptive statistics of responses are presented as frequencies and percentages (for categorical variables) and medians and interquartile ranges (IQRs; for continuous variables). Missing data in the final analysis sample were negligible; denominators are presented to indicate instances of missing data. Burnout rates are presented as frequencies and percentages with Clopper-Pearson 95% confidence intervals, and means and standard deviations are presented for each continuous subscale (emotional exhaustion, depersonalization, and personal accomplishment). Assessment of the generalizability of the study respondents was performed by comparing age, geographic region, and gender identity between the analysis sample and the overall ASA population of active members. Age was compared between survey respondents versus the ASA population using median regression to estimate the difference with corresponding 95% CI. Differences between proportions were calculated for gender identity and geographic region using exact 95% CIs.

For statistical analysis, work support questions were considered in 3 categories (Not at all/A little, A moderate amount, A lot/A great deal), and other Likert scale questions were dichotomized as (Not at all/A little/ A moderate amount vs A lot/A great deal). Practice environment, geographic region, subspecialty, and gender identity were coded as a

categorical variable, age was dichotomized as age < 50 years, and all other variables were considered as dichotomous predictors.

Univariate comparisons were performed by comparing respondents with and without one manifestation of burnout (high score on the scales for emotional exhaustion and/or depersonalization) and by comparing respondents with and without Burnout Syndrome. Demographic and practice characteristics and support perceptions were analyzed using the Wilcoxon rank-sum test for continuous variables and the chi-square test for categorical variables. After univariate associations were determined for screening, all variables with  $P < 0.05$  on univariate testing were included in the multivariable logistic regression modeling. A final multivariable model was fit to obtain the adjusted associations between each potential risk factor and burnout, with the purpose of identifying independent risk factors associated with burnout. Results from multivariable modeling are presented as adjusted odds ratios (ORs) with corresponding 95% CIs and P values.

Current workplace perspectives were described using frequencies and percentages, and burnout rates were assessed within subgroups defined by workplace perspectives. A supplemental analysis was performed to compare demographics, practice characteristics, support perceptions, and burnout rates by the likelihood to leave current job within the next 2 years using univariate statistics to compare likely/very likely versus unlikely/very unlikely, including the Wilcoxon rank sum test and the chi-square test.

No statistical power calculation was conducted prior to the study, because the sample size was based on the number of complete survey responses. For all statistical analyses, effect sizes or differences reaching a two-tailed  $P < 0.05$  were considered to be statistically significant. All statistical analyses were performed using Stata (version 16.1, StataCorp, College Station, TX).

## RESULTS

### Response Rate

Of the 24,680 US attending anesthesiologists who received the email invitation, 2,933 (11.9%) opened the survey link and were considered to have participated. Of those who opened the link, 2,698 (92.0%) completed the survey and were included in the statistical analysis (effective 10.9% response rate). Among the sample size of  $N = 2698$  survey respondents, the following are the number of respondents who availed themselves of the opportunity to provide demographics data: gender identity ( $n = 2543$ ), age ( $n = 2599$ ), identify as underrepresented on the basis of race, religion, LGBTQIA+ status, ESL ( $n = 2445$ ).

### Physician Characteristics

Participant characteristics are presented in Table 1. While limited, basic information on ASA US attending anesthesiologist members was provided to the authors for comparison to the study cohort. The geographic location of participants matched the ASA population closely with few differences, namely a slightly lower proportion of participants from the mid-Atlantic (difference,  $-2.2\%$ ; 95% CI,  $-3.5\%$  to  $-0.9\%$ ) and west south central (difference,  $-2.2\%$ ; 95% CI,  $-3.4\%$  to  $-1.0\%$ ) geographic regions as compared to the ASA population.

The median age of participants was 50 yr (interquartile range, 42 to 59 yr), compared with 48 (interquartile range, 41 to 58 yr) for the ASA population (difference, 2 yr; 95% CI, 1.4 to 2.6 yr). Of the respondents, 33.2% identified as female, compared to 29.6% of the ASA population (difference, 3.6%; 95% CI, 1.7% to 5.5%). Due to editorial and reviewer concerns regarding the question on practice environment, particularly the reporting accuracy and overlap of possible responses, we have post hoc considered this question flawed and removed its analysis from this report. The most prevalent subspecialties of practice were general (58.9%), pediatric (11.9%), and cardiothoracic (10.5%) anesthesiology. The median time since completion of training was 17 yr (interquartile range, 10 to 27 yr). Of the participants, 86.2% worked at least 40 hours per week, 78.4% experienced recent perceived staffing shortages, 52.2% felt little-to-no support in their work life, 22.9% felt little-to-no support in their home life, and 71.0% had caregiving responsibilities. Numerous participants identified as underrepresented based on race (10.8%), religion (4.5%), lesbian, gay, bisexual, transgender, queer/questioning, intersex, and asexual status (3.5%), and English as a second language (5.5%).

Workplace-related perspectives of US attending anesthesiologists are shown in Table 2. Of the respondents, 37.9% (1,022 of 2,698) acknowledged that the pandemic had accelerated their retirement plans, 36.0% (970 of 2,698) were likely or very likely to leave their current position within the next two years, and 24.7% (666 of 2,698) have reduced their weekly hours since the pandemic or plan to do so in the next year.

### Prevalence of Burnout in Anesthesiology in 2022

The current rate of high risk for burnout and burnout syndrome compared to pre-pandemic levels is shown in Figure 2. In this follow-up survey, the rate of high risk for burnout and burnout syndrome among US attending anesthesiologists was 67.7% (1,827 of 2,698) and 18.9% (510 of 2,698). This is an increase of 14.4% (59.2% to 67.7%) and 37.0% (13.8% to 18.9%) of high-risk for burnout and burnout syndrome, respectively, from early 2020 to late 2022.<sup>9</sup> Figures 3 and 4 show the prevalence of burnout by geographic region and subspecialty, respectively. The highest rates of high risk for burnout (78.2%) and burnout syndrome (28.2%) were seen in the east south central geographic region. Among subspecialties, the highest rates of high risk for burnout (77.0%) and burnout syndrome (23.0%) were seen in critical care intensivists. US attending anesthesiologists who reported being likely or very likely to leave their job in the next two years had higher rates of high risk for burnout (78.5% vs. 55.7%,  $p<0.001$ ) and burnout syndrome (24.3% vs. 13.3%,  $p<0.001$ ) compared to those unlikely or very unlikely to leave [Figure 5].

### Factors Associated with Burnout

Results from a univariate analysis for high risk for burnout and burnout syndrome are shown in Table 3. After univariate analysis, multivariable logistic regressions were performed to identify independent risk factors for high risk for burnout and burnout syndrome. The results of these analyses are shown graphically in Figure 6 and as data in Table S2 and Table S3.

Variables independently associated with high risk for burnout included perception of support in work-life (a lot or a great deal; not at all or a little support: odds ratio, 9.2; 95% CI, 7.0



to 12.1; a moderate amount of support: odds ratio, 2.86; 95% CI, 2.19 to 3.72), presence of a moderate or more amount of perceived staffing shortages (odds ratio, 1.96; 95% CI, 1.57 to 2.43), working more than 40 hours per week (odds ratio, 1.80; 95% CI, 1.38 to 2.34), perception of support in home life (a lot or a great deal; not at all or a little support: odds ratio, 1.63; 95% CI, 1.26 to 2.12), and time since completion of training (odds ratio, 0.97 per year; 95% CI, 0.96 to 0.99).

Independent factors associated with the development of burnout syndrome included perception of support in work-life (a lot or a great deal; not at all or a little support: odds ratio, 6.3; 95% CI, 3.81 to 10.4; a moderate amount of support: odds ratio, 2.07; 95% CI, 1.22 to 3.51), perception of support in home life (a lot or a great deal; not at all or a little support: odds ratio, 1.67; 95% CI, 1.29 to 2.17; a moderate amount of support: odds ratio, 1.50; 95% CI, 1.16 to 1.94), working more than 40 hours per week (odds ratio, 1.52; 95% CI, 1.04 to 2.21), and time since completion of training (odds ratio, 0.96 per year; 95% CI, 0.95 to 0.98). English as a second language status was negatively associated with the presence of burnout syndrome (odds ratio, 0.49; 95% CI, 0.278 to 0.86).

Based on editorial and reviewer feedback, we also performed additional post-hoc analysis. We have implemented a sensitivity model including all theoretically important variables and reported the results in Supplemental Table S4. This model in which all theoretically important variables are included shows similar findings to the main multivariable results presented in Figure 6.

### Perspectives on Beneficial Interventions for Burnout

Respondent's opinions of proposed interventions to address burnout are shown in Figure 7. Over half of respondents supported adequate staffing (69.1%), improved workplace morale or culture (55.9%), increased compensation (53.5%), reduced weekly hours (52.8%), increased schedule flexibility (51.7%), and improved support from leadership (51.3%) as interventions to address burnout.

## DISCUSSION

### High Rates of Anesthesiologist Burnout Since Before the COVID-19 Pandemic

Our results clearly demonstrate that burnout continues to be prevalent in US attending anesthesiologists and has worsened since early 2020. The rates of anesthesiologists at risk for burnout and with burnout syndrome were 67.7% (1827/2698; 95% CI: 65.9%, 69.5%) and 18.9% (510/2698; 95% CI: 17.4%, 20.4%) in November 2022, compared to 59.2% (2307/3898; 95% CI: 57.6%, 60.7%) and 13.8% (539/3898; 95% CI: 12.8%, 15.0%) in March 2020, respectively.<sup>9</sup> This upward trend is seen across physicians in numerous subspecialties of medicine. For instance, a recent article by *Shanafelt et al.* utilizing a mixed sample of physicians from the end of 2021 found 62.8% of respondents to be at high risk for burnout, up from 38.2% and 43.9% in 2020 and 2017, respectively.<sup>3,4,21</sup>

Numerous factors, both directly and indirectly related to the COVID-19 pandemic, have likely contributed to the increase in burnout observed during recent years. During the pandemic, anesthesiologists were at the forefront of caring for patients with COVID-19.



As noted by *Hyman*, anesthesiologists are the “Swiss Army Knives” of medicine, given their diverse areas of expertise.<sup>10</sup> Indeed, during the pandemic, anesthesiologists were deployed in multiple roles across hospitals. Anesthesiologists’ repeated exposure to long hours, inadequate staffing, caring for critically ill patients with sparse personal protective equipment and fears of occupational exposure, likely exacerbated their stress.<sup>11</sup> To amplify this situation, anesthesiologists, especially those with caregiving responsibilities for school-aged children, experienced increased demand and unpredictability of responsibilities at home.<sup>22–25</sup>

### Factors Associated with Burnout in US Attending Anesthesiologists

As in 2020, workplace factors, including perceived support in the workplace, staffing shortages, and the need to work >40 hours per week, remain associated with burnout in 2022.<sup>9</sup> Perceived level of support at work remained the most notable factor associated with burnout in this follow-up analysis. Compared to respondents feeling highly supported at work, those reporting little to no support had a remarkably increased odds of being at high risk for burnout (OR: 9.2; 95% CI, 7.0 to 12.1) or having burnout syndrome (OR: 6.3; 95% CI, 3.81 to 10.4). Further, those feeling only moderate support at work had higher odds of being at high risk for burnout (OR: 2.9; 95% CI, 2.19 to 3.72) or having burnout syndrome (OR: 2.07; 95% CI, 1.22 to 3.51) compared to those feeling supported.

In contrast to physicians from other specialties, our respondents were less likely to perceive improved electronic medical record (EMR) efficiency or the ability to disengage from work while at home to be beneficial in reducing burnout. While this study did not delve into specific reasons behind this observation, several factors could potentially explain this finding. Anesthesia Information Management Systems (AIMS) differ from other EMRs in that they have been specifically developed to support clinical anesthesia workflow. While EMR inbox messages are a strong driver of burnout and have been described as an “involuntary, never-ending, after-hours second job for physicians” in other specialties, this does not seem to be the case in anesthesia.<sup>26</sup> Anesthesiologists’ work is centered around acute patient care with fewer ongoing responsibilities once leaving the hospital, contributing to less “after-hours” work. This strengthens the case for focusing efforts on other areas to improve workplace culture and this beneficial work structure could potentially serve as a recruitment tool to the field of anesthesiology.

Among personal factors, age less than 50 years remains significantly associated with being at high risk for burnout and burnout syndrome. Studies of burnout among anesthesiologists and anesthesiology trainees suggest that younger age is associated with burnout.<sup>27–29</sup> In fact, *Morais and colleagues*<sup>29</sup> concluded that anesthesiologists with more than 20 years of practice experienced less emotional fatigue compared to younger ones, even though their exposure to stress was over a longer period. This could be explained by development of coping mechanisms through work experience. Additionally, junior anesthesiologists experiencing low levels of personal accomplishments coupled with higher emotional exhaustion have contributed to the high prevalence of burnout.<sup>27</sup>

Gender identity, race, and underrepresented status held no statistically significant association with burnout in this updated analysis. Interestingly, English as a second language status

continues to hold a negative association with burnout syndrome. The rationale for this is unclear and complicated by multiple confounders like race and ethnicity but may be tied to previously reported increased levels of resilience in this population.<sup>30</sup> These findings largely echo our 2020 analysis, suggesting consistency regarding burnout risk factors. [Figure 6]

### **Geographic Trends in US ASA Member Attending Anesthesiologist Burnout**

Anesthesiologists' rates of being at high risk for burnout and having burnout syndrome varied considerably by geographic location. US attending anesthesiologists practicing in the east south central states (Kentucky, Tennessee, Mississippi, and Alabama) had the highest rates of burnout. While rates of perceived staffing shortages were not significantly worse than other geographic regions (77.4% (96/124; 95% CI: 69%, 84.4%) east south central vs. 78.4% (2019/2574; 95% CI: 76.8%, 80%) all other geographic regions), perceived level of support at work trended lower, with 59.7% (74/124; 95% CI: 50.5%, 68.4%) of respondents in this geographic region reporting little to no support at work vs. 51.8% (1334/2574; 95% CI: 49.9%, 53.8%) in other geographic regions (note, this did not reach statistical significance,  $p=0.087$ ). National and regional initiatives to support anesthesiologist well-being are recommended to provide resources and support for this geographic region.

### **Staffing Shortages & Retention in Anesthesiology**

Perceived staffing shortages have increased substantially since the onset of the pandemic. In 2020, 35.1% of US attending anesthesiologists reported experiencing workplace staffing shortages compared to 78.4% in 2022.<sup>9</sup> When asked which interventions would help their well-being, some of the most cited changes were related directly or indirectly to staffing. [Figure 7] The ASA convened an Anesthesia Workforce Summit in June 2022, with solutions focusing on the imbalance of supply and demand in the anesthesia workforce.<sup>15</sup> Their recommendations include ideas to enhance recruitment and retention,<sup>31</sup> develop new paradigms in anesthesia training,<sup>32</sup> and improve utilization of available anesthesia resources.<sup>33</sup>

Anesthesia staffing is strained for several reasons. First, there has been a 48% decrease in total surgical procedure volume immediately after the March 2020 recommendations to cancel elective surgical procedures. Then after reopening, the rate of surgical procedures rebounded to 2019 levels and was maintained through the peak burden of COVID-19 during the fall and winter surge.<sup>34</sup> Second, the aging "baby boomer" generation has increased rates of anesthesiologists retiring concurrent with more older patients require care as well as higher acuity of care.<sup>35-37</sup> Third, the pandemic has influenced anesthesiologists to reduce hours or leave the workforce. For example, we found 37.9% of anesthesiologists plan to retire early and 24.7% have already or plan to reduce their hours. Anesthesiologists face additional challenges due to the evolving clinical environment. Physicians experience higher production pressure as private equity firms expand their presence in healthcare<sup>38</sup> and hospitals encounter mounting financial difficulties. Production pressure is a known source of burnout since it can jeopardize patient safety and threaten anesthesiologists' professional identity.<sup>39</sup> In addition, the acquisition of physician practices by private equity firms challenges organizational support, since these firms "target businesses with the potential for rapid growth, with the intention of exiting the investment in three to five

years”.<sup>40</sup> Anesthesiologists at high risk for burnout and those with burnout syndrome more often intend to leave their current job within the next 2 years [Figure 5]. This represents a vicious cycle, where staffing shortages drive burnout, and burnout leads to further attrition.

The phenomenon of decreased staffing and early retirement is not isolated to anesthesiology or medicine. In a recent article in the *Harvard Business Review*, the topic of the “Great Resignation” was discussed as a record number of Americans have been leaving their careers throughout the COVID-19 pandemic. Interestingly, mid-career employees and those in the technology and healthcare industries saw the highest attrition rates.<sup>41</sup> In addition to direct pandemic-related stressors, *Gulati* has suggested that this “Great Resignation” is closer to a “Great Rethink” wherein employees are questioning their careers entirely.<sup>42</sup> To borrow knowledge from the business world to address these issues, healthcare leaders need to 1) Quantify the problem by identifying the rate and impact of turnover and 2) Identify the root causes of employee attrition, which vary greatly across groups. Solutions must be individualized to the institution and physician.

### Addressing Burnout in Anesthesiology

There is no single clear solution to burnout in anesthesiology since each institution has different practices and stressors. In its 2019 report on fostering professional well-being, the National Academy of Medicine recommends the use of human-centered design processes to co-design solutions and interventions to address clinician burnout.<sup>43</sup> A step-by-step approach to addressing physician well-being that incorporates human-centered design, quality improvement, and implementation science has already been described.<sup>44</sup> Our study provides a starting point for human-centered design by presenting examples of potential solutions to aid in designing sustainable well-being solutions for anesthesiologists. Solutions related to increased workplace support, adequate staffing, schedule flexibility, and compensation were this sample’s most agreed-upon interventions. [Figure 7]

In this study, we have also identified populations at high risk for burnout and potentially attrition, including US attending anesthesiologists who are <50 years of age and with caregiving responsibilities [Table S1]. Additional studies on specific strategies to retain anesthesiologists in these groups will provide insight into interventions that can reduce attrition and prevent further staffing shortages. Recruitment and retention of anesthesiologists is critical for the future success of our specialty. Adequate anesthesia staffing and improved workplace morale and culture, while inherently complex and multifaceted, are not only avenues to address burnout, but also the desired outcomes of reducing burnout. By implementing these solutions and providing support to our colleagues, we can help drive a positive feedback loop in our field.

“Support” from leadership at an organizational level is crucial in preventing burnout among healthcare workers. One way to do this is using Leiter’s six areas of worklife. Workload, control, reward, community, fairness, and values are described as the most relevant to people’s relationship with their work. These areas of the work environment are relevant to employees’ relationship with their own work as any incongruity between organizational support systems and the emotional requirements of staff members represents a pervasive mismatch throughout the human services sector.

Organizational support is essential to prevent burnout among healthcare workers. Using Leiter's six areas of work life as framework, hospitals can create work environments that proactively address and prevent burnout among the workforce. Akin to those principles, organizations may empower anesthesiologists by providing them with more autonomy and management over work practices such as on-call scheduling or early/late shift requests. This may lead to better execution of their duties, more satisfaction with their work and less risk of burnout. Likewise, organizational leadership should regularly evaluate work requirements for their employees, ensuring that anesthesiologists have sensible obligations and adequate resources to complete their tasks, safeguarding the wellbeing of anesthesiologists and patients alike. Physician leaders need to advocate for initiatives that utilize flexible anesthesia care models and support anesthesia retention and recruitment to mitigate the staffing shortage crisis that we currently face. Additionally, it is imperative that organizations ensure that their workers are reasonably valued and equitably compensated for their roles within the organization. It is vital that healthcare organizations attempt to provide as much transparency and objectivity when making decisions and allocating institutional resources among their employees. This can further benefit both organizations and anesthesiologists alike by building an inclusive community that allows for constructive associations between peers and leaders within the organization. Lastly, it is important that organizations have a clear strategy to prevent clinicians' burnout by sustaining and supplementing well-being programs that are actively involved in policy making groups at the organization level. Every anesthesia practice is unique, and it is incumbent upon each department to determine which areas of worklife need additional support.<sup>45</sup>

## LIMITATIONS

The response rate of this survey was low at 10.9% as compared to our 2020 survey (13.6%),<sup>9</sup> although this was higher than recent large-scale burnout surveys among physicians in 2021 (5.6%)<sup>3</sup> and 2020 (7.1%).<sup>20</sup> Response rates for burnout surveys have consistently decreased over time and this does raise concerns for the generalizability of the results. The sample population had similar characteristics to the limited data available on the active US ASA member attending anesthesiologist population, lending some credibility to its generalizability to the field. Using the full 22-question Maslach Burnout Inventory Human Services Survey increased the validity of burnout metrics,<sup>2</sup> but limited the number of additional questions that could be asked while maintaining a meaningful completion rate. Additionally, while we kept the survey instrument very similar to the one conducted in 2020, particularly with the use and wording of validated metrics, demographic and practice factor questions, several questions were added to this survey and the length and order of questions may have had unknown impact on response rate and answers. Also, while we tried to query major areas of stress, there were certainly unstudied external stressors present. Finally, these results may represent an underestimate of the prevalence of burnout due to dropout from the workforce of particularly stressed and vulnerable (e.g. immunocompromised or older) anesthesiologists between 2020 and 2022.

## CONCLUSION

Since our prior similar study in early 2020, burnout and staffing shortages have increased significantly in US ASA member attending anesthesiologists. We have identified aspects and geographic regions for targeted support and “How supported do you feel in your worklife?” remains the consistent central factor associated with burnout across the field. These results, while highlighting worsening burnout, also highlight appealing and rewarding characteristics of a career in anesthesiology.

## Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

## Acknowledgments:

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## Appendix A: Survey Instrument from 2022

### Anesthesiology Profession Questionnaire Individual Job Questions

This survey aims to attain an updated look at the nature of burnout in practicing anesthesiologists, including assessing risk factors and opinions on potential interventions to improve well-being.

Please answer each question truthfully and to the best of your knowledge. All answers are anonymous.

This complete survey should take no more than 3-5 minutes of your time.

- 1) What is your primary practice environment?
  - a. Academic
  - b. Community Hospital
  - c. Private Practice – Large group (>50 anesthesiologists)
  - d. Private Practice – Small group (≤ 50 anesthesiologists)
  - e. Partner in practice
  - e. Government Facility
  - f. Other (please specify)
  
- 2) In what region do you primarily work?
  - a. South Atlantic (DE, MD, VA, WV, NC, SC, GA, FL, and DC)
  - b. East North Central (IL, IN, MI, OH, and WI)
  - c. East South Central (AL, KY, MS, and TN)
  - d. Mid-Atlantic (NY, NJ, and PA)
  - e. Mountain (AZ, CO, ID, MT, NV, NM, UT, and WY)
  - f. New England (CT, ME, MA, NH, RI, and VT)
  - g. Pacific (CA, OR, WA, AK, and HI)
  - h. West North Central (IA, KS, MN, MO, NE, ND, and SD)
  - i. West South Central (AR, LA, OK, and TX)
  - j. Other (E.g. US territories, please specify)
  - k. Prefer not to answer
  
- 3) What subspecialty of anesthesiology do you primarily practice?
  - a. Cardiothoracic Anesthesiology
  - b. Critical Care Medicine
  - c. General Anesthesiology
  - d. Neuroanesthesiology
  - e. Obstetric Anesthesiology
  - f. Pain Medicine
  - g. Pediatric Anesthesiology
  - h. Regional Anesthesiology
  - i. Research
  - j. Other (specify)
  
- 4) In what year did you finish anesthesiology residency? (1950 to 2022 drop-down)
  
- 5) How many hours do you work in an average week?

- a. 20 or less
- b. 21-30
- c. 31-40
- d. 41-50
- e. 51-60
- f. More than 60

- 6) In the past month, has your primary practice experienced anesthesia staffing shortages?
- a. Not at all
  - b. A little
  - c. A moderate amount
  - d. A lot
  - e. A great deal
- 7) How supported do you feel in your work-life?
- a. Not at all
  - b. A little
  - c. A moderate amount
  - d. A lot
  - e. A great deal
- 8) How supported do you feel in your out-of-work life?
- a. Not at all
  - b. A little
  - c. A moderate amount
  - d. A lot
  - e. A great deal
- 9) Do you have any caregiving responsibilities?
- a. Yes
  - b. No
- 10) If you do have caregiving responsibilities, for how many people? (children, older adults, etc.)
- 11) Has the COVID-19 pandemic accelerated your plans for retirement?
- a. Yes
  - b. No
- 12) How likely are you to leave your current job within the next 2 years?
- a. Very unlikely
  - b. Unlikely
  - c. Neutral
  - d. Likely
  - e. Very likely
- 13) Have you changed your full-time status since the beginning of 2020 or do you plan to do so in the next year?
- a. Yes – I have reduced my employment status (e.g. full-time to part-time)
  - b. Yes – I have increased my employment status (e.g. part-time to full-time)
  - c. Yes – I am no longer practicing
  - d. Yes – I have returned to practice



- e. No
- f. Other (please specify)

14) Which of these changes to your workplace or work life do you feel would significantly benefit you? (select all that apply)

- a. Increased flexibility in work hours
- b. Less average weekly hours worked
- c. Increased number of vacation days
- d. Adequate overall anesthesia staffing
- e. Improved workplace morale or culture
- f. Improved support from leadership
- g. Ability to disengage with work when not at work
- h. Increased compensation
- i. Ability to work from home on non-clinical days
- j. Completing training in resilience, self-reflection, or mindfulness
- k. Assistance in finding daycare or elder care services
- l. Improved electronic medical record (EMR) efficiency
- m. The creation of a wellness committee with the ability to impart departmental change
- n. Other (Please specify)

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15-36 MBI-HSS

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37-40 Self-Valuation Questions

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Demographic Questions

Please answer each question truthfully and to the best of your knowledge. All answers are anonymous.

If you would prefer not to disclose, please skip, Por use the "prefer not to answer" option in each question.

- 41) What Is your gender identity?
- a. Female
  - b. Male
  - c. Other (please specify in the next question)
  - d. Prefer not to answer
- 42) What is your gender identity? (this question is only asked if "other" chose above)
- a. Cisgender man
  - b. Cisgender woman
  - c. Transgender man
  - d. Transgender woman
  - e. Gender non-binary
  - f. Gender non-conforming
  - e. Other (please specify)

43) Which of the following best describes your racial identity/ethnicity?

- a. Asian or Pacific Islander
- b. Black or African American
- c. Hispanic or Latino
- d. Native American or Alaskan Native
- e. White or Caucasian
- f. Multiracial or Biracial
- g. A race/ethnicity not listed here
- h. Prefer not to answer

44) What is your age? (drop-down 21 to 99)

45) Are you a member of an underrepresented or vulnerable group in anesthesiology? If yes, please choose all that apply.

- a. I am not a member of an underrepresented or vulnerable group
- b. Underrepresented racial minority
- c. Underrepresented religious minority
- d. Member of LBGTQIA+ community (please specify which – free text)
- e. English as a second language
- f. Other (specify)

46) Do you have any additional comments or thoughts on the concept of burnout in anesthesiology that you would like to share? (free text answer)

## Appendix B: Survey Instrument from 2020

### Individual Job Questions

The purpose of this survey is to assess the nature of burnout in practicing anesthesiologists, focusing on professional and individual risk factors in order to more effectively drive systemic changes to improve well-being.

Please answer each question truthfully and to the best of your availability. All answers are anonymous.

This complete survey should take no more than 3-5 minutes of your time.

\* 1. What is your primary practice environment?

- University Hospital/Academic Appointment
- Community Hospital
- Private Practice - Hospital Based
- Private Practice - Outpatient Based
- Other (please specify)

\* 2. Do you have someone you currently identify as a professional mentor?

- Yes
- No

\* 3. In what year did you complete your last year of anesthesia training, including fellowships?

\* 4. How many hours do you work in an average week?

- 20 or less
- 21-30
- 31-40
- 41-50
- 51-60
- More than 60

\* 5. In the past month, has your primary practice experienced anesthetic staffing shortages?

- Not at all      A little      A moderate amount      A lot      A great deal
-

\* 6. How supported do you feel in your work-life?

Not at all      A little      A moderate amount      A lot      A great deal

\* 7. How often is there someone available at your institution with whom you can safely talk to about your concerns regarding your work?

Never      Rarely      Sometimes      Often      Always

\* 8. How supported do you feel in your out-of-work life?

Not at all      A little      A moderate amount      A lot      A great deal

\* 9. Do you currently have any caregiving responsibility outside of work?

Yes  
 No

10. If you do have caregiving responsibility, for how many people? (children, older parents, etc.)

\*\* MBI-HSS Questionnaire (#11-32) \*\*

#### Demographic Questions

Please answer each question truthfully and to the best of your availability. All answers are anonymous.

This section is optional.

33. What is your gender?

- Female  
 Male  
 Other (specify)

34. What is your age?

35. Are you a member of an underrepresented or vulnerable group in anesthesia? If yes, please choose all that apply. If no, please skip.

- Underrepresented racial minority - please specify below (optional)  
 Underrepresented religious minority - please specify below (optional)  
 Member of the LGBTQIA+ community - please specify below (optional)  
 English as a second language

Other (please specify)

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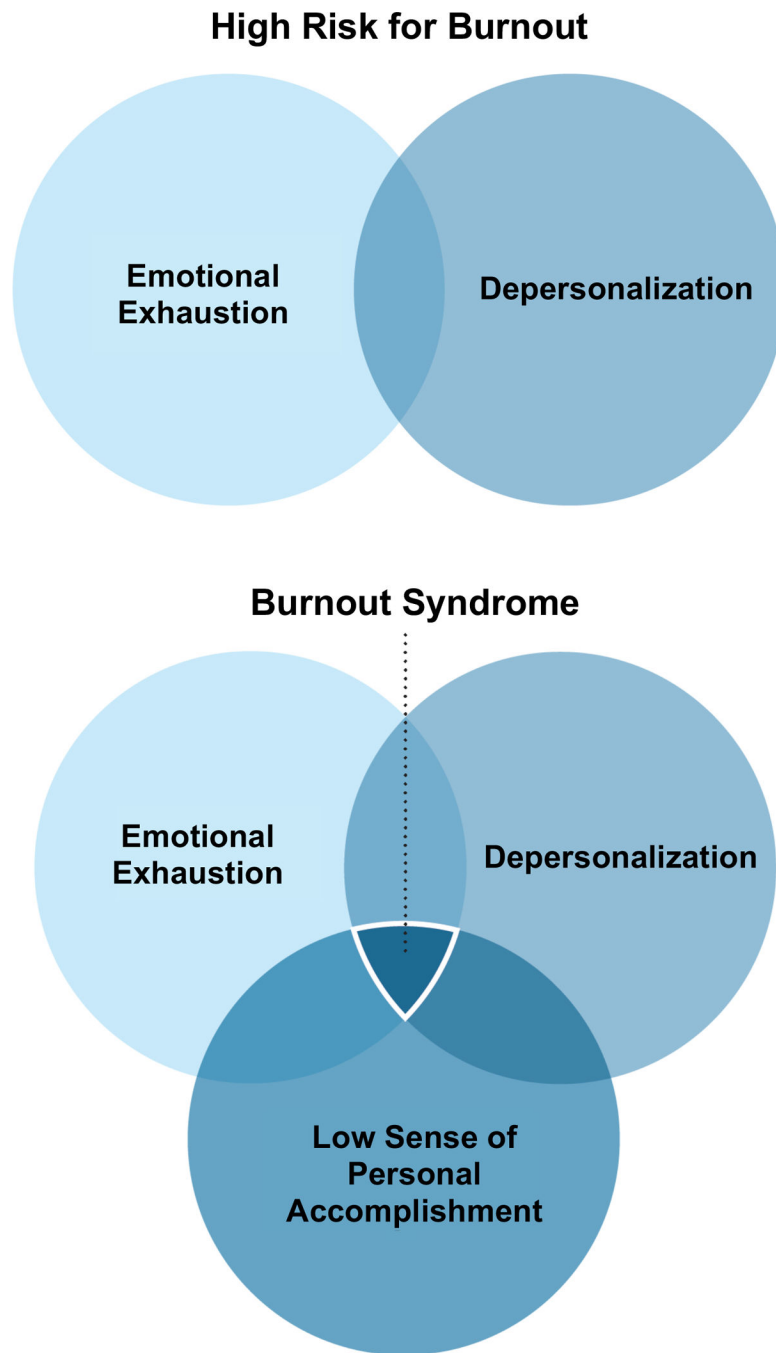
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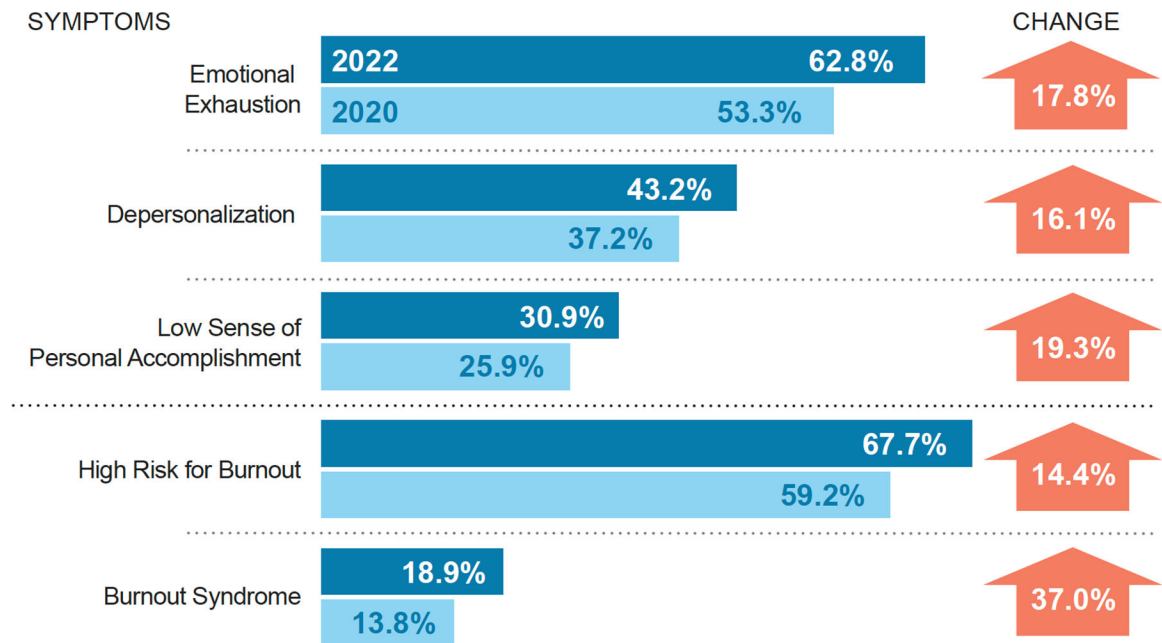
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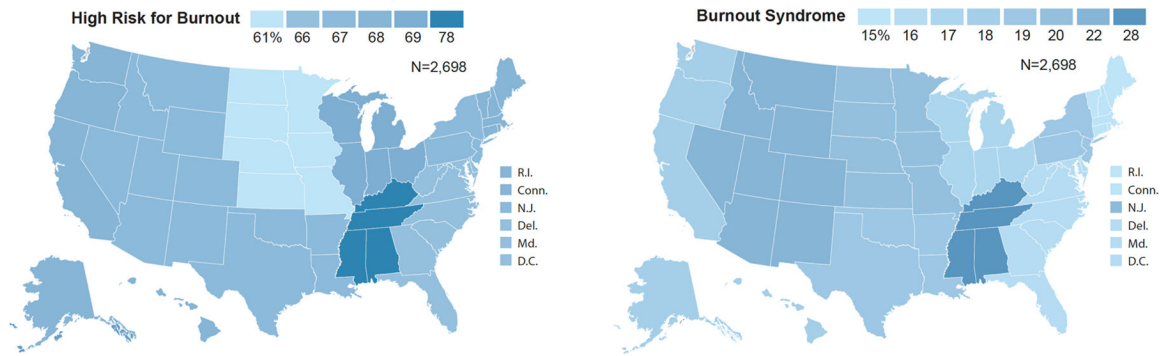
**Figure 1: Burnout versus burnout syndrome.**

High risk for burnout is defined as experiencing emotional exhaustion and/or depersonalization. Burnout syndrome is characterized by concurrently experiencing emotional exhaustion, depersonalization, and a low sense of personal accomplishment.



**Figure 2: Change in burnout symptoms from 2020 to 2022.**

Initial burnout rate and symptoms based on responses from 3,898 US attending anesthesiologists in March 2020.<sup>9</sup> Updated burnout rate and symptoms based on 2,698 responses in November 2022. The change arrows signify the burnout rate and symptoms increase from 2020 to 2022.



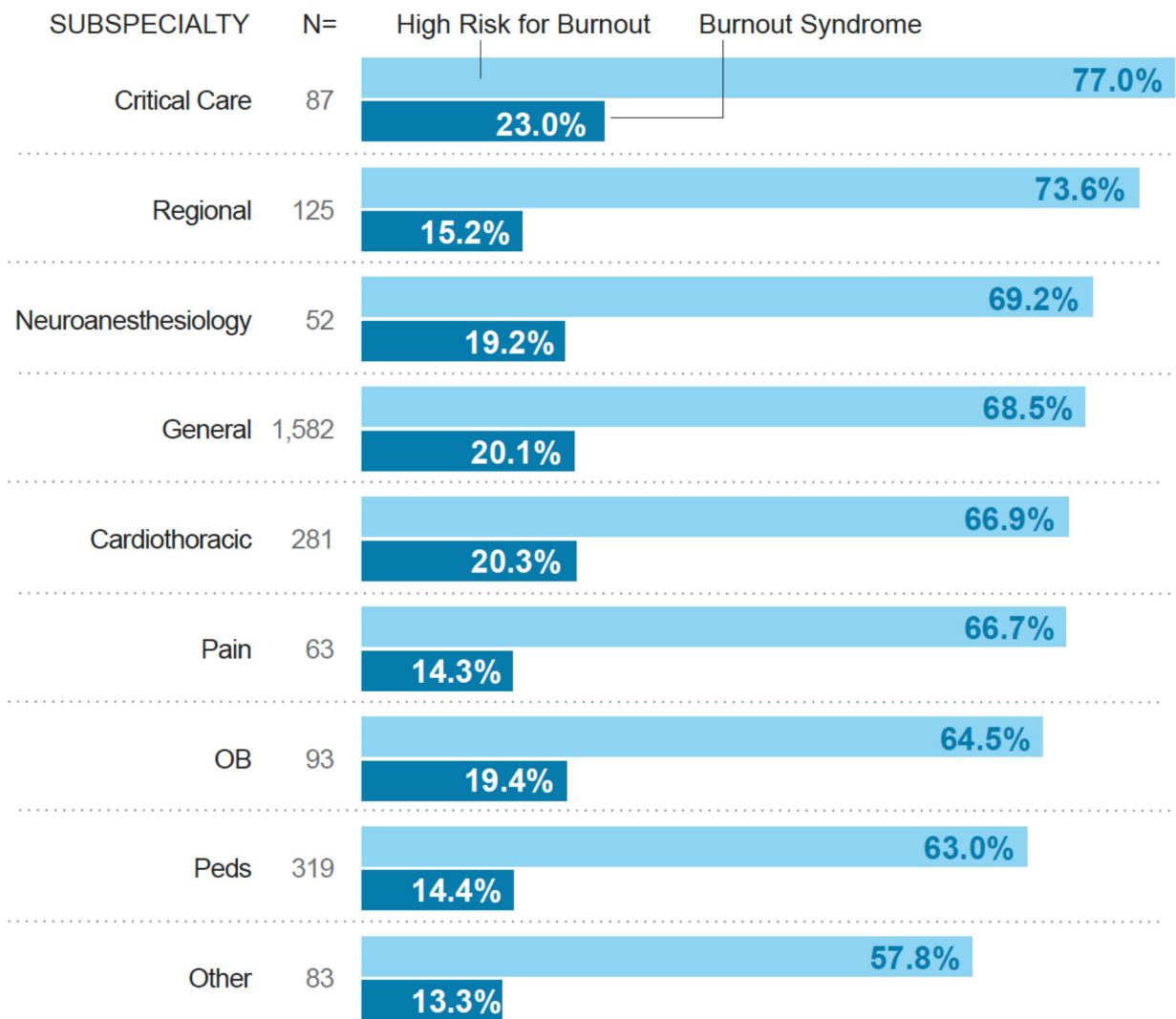
**Figure 3: Geographic distribution of burnout and burnout syndrome across the United States.** Rates of high risk for burnout and burnout syndrome for each geographic region are shown based on 2,698 responses from US attending anesthesiologists in November 2022.

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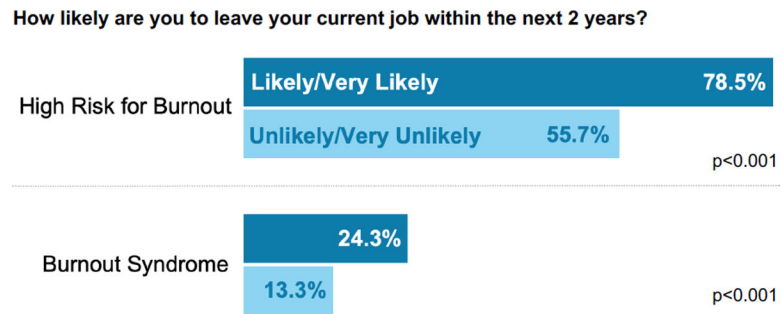
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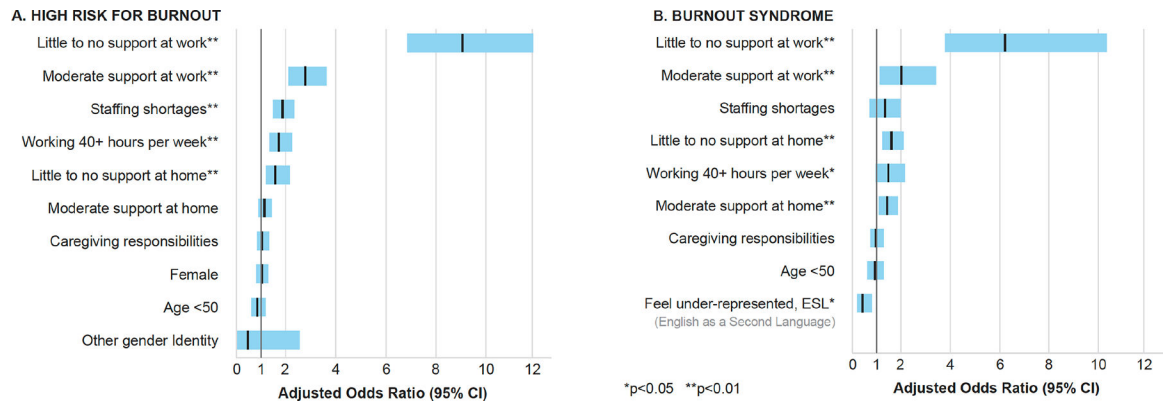
**Figure 4: Burnout and burnout syndrome by subspecialty of anesthesiology.**

Rates of high risk for burnout and burnout syndrome are shown for each subspecialty based on 2,698 responses from US attending anesthesiologists in November 2022.

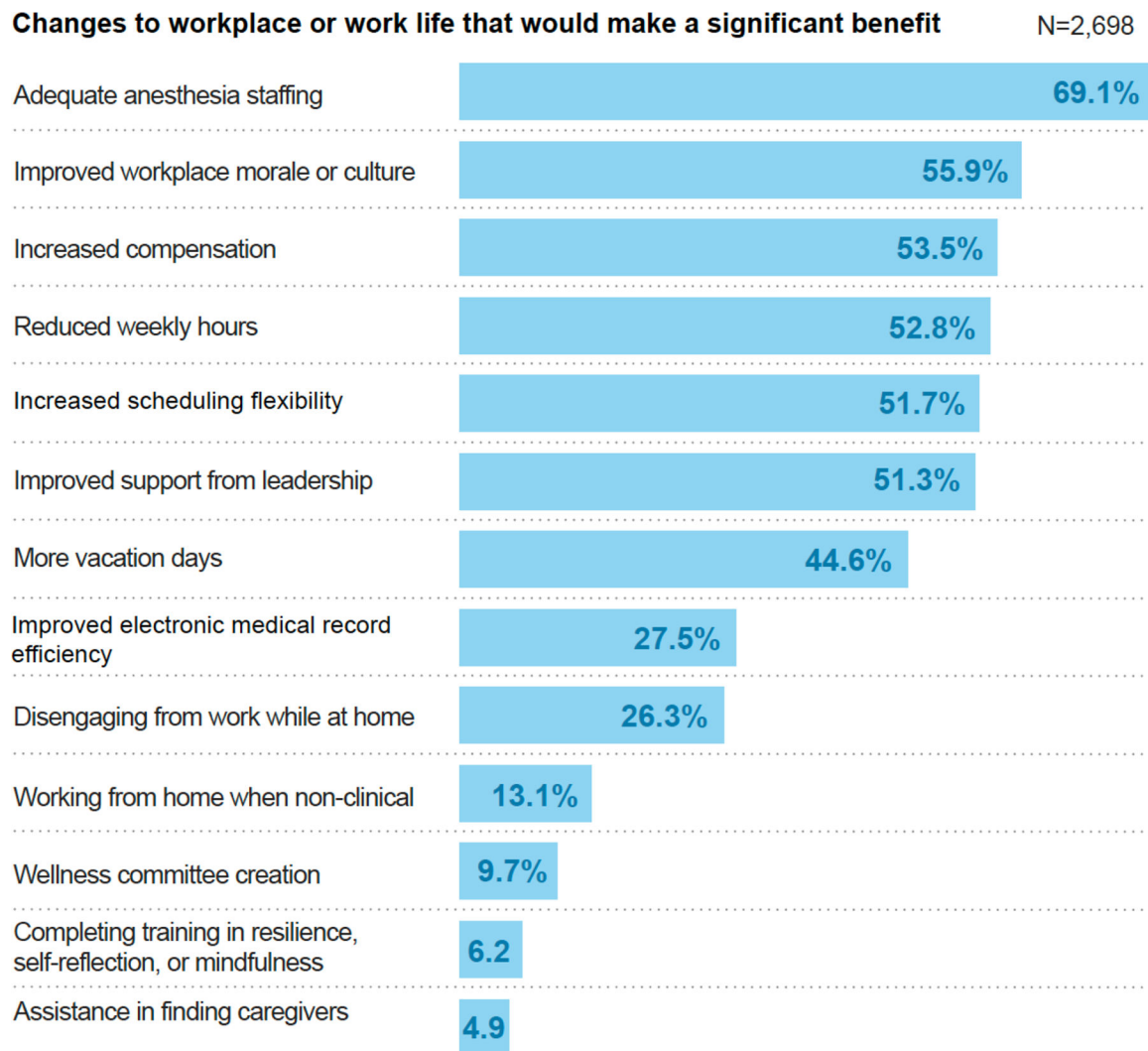


**Figure 5: Likelihood of leaving current job based on burnout status.**

The rate of high risk for burnout and burnout syndrome are shown for US attending anesthesiologists who are likely/very likely (N=970) and unlikely/very unlikely (N=1,169) to leave their job in the next 2 years. The significance between the likeliness of leaving groups are based on chi-square testing.



**Figure 6: Independent risk factors associated with burnout and burnout syndrome.** Risk factors were determined based on multivariable logistic regression of 2,698 responses from US attending anesthesiologists in November 2022. High Risk for Burnout (A) and Burnout Syndrome (B).



**Figure 7: Perceived beneficial interventions to address burnout among US attending anesthesiologists.**

The percentages shown are of 2,698 US attending anesthesiologists surveyed in November 2022 who agree that each intervention will help address burnout in anesthesiologists.



**Table 1:**

Description of participant characteristics

Variable	Analysis Sample (N = 2,698)	ASA Active Members (N = 25,639)	Difference (95% CI)
<b>Geographic region</b>			
East North Central (IL, IN, MI, OH, and WI)	418 (15.5%)	3,697/25,112 (14.7%)	0.8% (-0.6%, 2.2%)
East South Central (AL, KY, MS, and TN)	124 (4.6%)	1,164/25,112(4.6%)	0% (-0.8%, 0.8%)
Mid-Atlantic (NY, NJ, and PA)	329 (12.2%)	3,619/25,112 (14.4%)	-2.2% (-3.5%, -0.9%)
Mountain (AZ, CO, ID, MT, NV, NM, UT, and WY)	256 (9.5%)	2,103/25,112 (8.4%)	1.1% (-0.1%, 2.3%)
New England (CT, ME, MA, NH, RI, and VT)	186 (6.9%)	1,468/25,112 (5.9%)	1% (0%, 2%)
Pacific (CA, OR, WA, AK, and HI)	441 (16.4%)	3,731/25,112 (14.9%)	1.5% (0%, 3%)
South Atlantic (DE, MD, VA, WV, NC, SC, GA, FL, and DC)	481 (17.8%)	4,652/25,112 (18.5%)	-0.7% (-2.2%, 0.8%)
West North Central (IA, KS, MN, MO, NE, ND, and SD)	183 (6.8%)	1,608/25,112 (6.4%)	0.4% (-0.6%, 1.4%)
West South Central (AR, LA, OK, and TX)	263 (9.8%)	3,009/25,112 (12%)	-2.2% (-3.4%, -1%)
Other (U.S. Territories such as Puerto Rico, Guam, etc.)	11 (0.4%)	61/25,112 (0.2%)	0.2% (-0.04%, 0.44%)
Prefer not to answer	6 (0.2%)	0/25,112 (0%)	0.2% (0%, 0.5%)
<b>Subspecialty</b>			
Cardiothoracic	281/2,685 (10.5%)		
Critical Care	87/2,685 (3.2%)		
General	1,582/2,685 (58.9%)		
Neuroanesthesiology	52/2,685 (1.9%)		
OB	93/2,685 (3.5%)		
Pain	63/2,685 (2.4%)		
Peds	319/2,685 (11.9%)		
Regional	125/2,685 (4.7%)		
Other	83/2,685 (3.1%)		
<b>Time since training complete (years)</b>	17 (10–27)		
<b>&gt;40 Hours working in an average week</b>	2,326 (86.2%)		
<b>Perceived anesthesia staffing shortages experienced in past month</b>			
Not at all/a little	583 (21.6%)		

Variable	Analysis Sample (N = 2,698)	ASA Active Members (N = 25,639)	Difference (95% CI)
A moderate amount/a lot/a great deal	2,115 (78.4%)		
<b>Feeling supported in work-life</b>			
Not at all/a little	1,408 (52.2%)		
A moderate amount	866 (32.1%)		
A lot/a great deal	424 (15.7%)		
<b>Feeling supported in out-of-work life</b>			
Not at all/a little	618 (22.9%)		
A moderate amount	754 (28%)		
A lot/a great deal	1,326 (49.1%)		
<b>Caregiving responsibilities</b>			
None	782 (29.0%)		
1 or 2 people	1,261 (46.7%)		
> 2 people	655 (24.3%)		
<b>Gender Identity</b>			
Female	871/2,627 (33.2%)	7,583/25,585 (29.6%)	3.6% (1.7%, 5.5%)
Male	1,664/2,627 (63.3%)	17,884/25,585 (69.9%)	-6.6% (-8.5%, -4.7%)
Other	8/2,627 (0.3%)	3/25,585 (0.01%)	0.29% (0.08%, 0.5%)
Prefer not to answer	84/2,627 (3.2%)	115/25,585 (0.5%)	2.7% (2%, 3.4%)
Age (years)	50 (42, 59)	48 (41, 58)	2 (1.4, 2.6)
<b>Identify as underrepresented on the basis of race</b>			
	265/2,445 (10.8%)		
<b>Identify as underrepresented on the basis of religion</b>			
	111/2,445 (4.5%)		
<b>Identify as underrepresented on the basis of LGBTQIA+ status</b>			
	86/2,445 (3.5%)		
<b>Identify as underrepresented on the basis of ESL</b>			
	134/2,445 (5.5%)		

Data are presented as n (%) or median (interquartile range). Denominators are displayed for variables with missing data.

Differences and 95% confidence intervals were calculated to assess the comparability of the analysis sample and the ASA population, for variables known in both.

Quantile regression on the 50<sup>th</sup> percentile (median) was used to estimate the difference with 95% confidence interval for age.

Exact confidence intervals are calculated for differences in percentages.  
LGBTQIA+, Lesbian, gay, bisexual, queer/questioning, intersex, and asexual status  
ESL, English as a second language

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**Table 2:**

Current workplace perspectives of anesthesiologists

Variable	Analysis Sample (N = 2,698)	High Risk for Burnout	Burnout Syndrome
<b>Has the COVID-19 pandemic accelerated your plans for retirement?</b>			
No	1,676 (62.1%)	970/1,676 (57.9%)	228/1,676 (13.6%)
Yes	1022 (37.9%)	857/1,022 (83.9%)	282/1,022 (27.6%)
<b>How likely are you to leave your current job within the next 2 years?</b>			
Very unlikely	609 (22.6%)	305/609 (50.1%)	65/609 (10.7%)
Unlikely	560 (20.8%)	346/560 (61.8%)	91/560 (16.3%)
Neutral	559 (20.7%)	415/559 (74.2%)	118/559 (21.1%)
Likely	446 (16.5%)	343/446 (76.9%)	106/446 (23.8%)
Very likely	524 (19.4%)	418/524 (79.8%)	130/524 (24.8%)
<b>Have you changed your full-time status since the beginning of 2020 or do you plan to do so in the next year?</b>			
No	1869 (69.3%)	1,212/1,869 (64.9%)	326/1,869 (17.4%)
Yes – I have reduced my employment status	666 (24.7%)	499/666 (74.9%)	150/666 (22.5%)
Yes – I have increased my employment status	59 (2.2%)	42/59 (71.2%)	17/59 (28.8%)
Yes – I am no longer practicing	39 (1.5%)	29/39 (74.4%)	7/39 (18%)
Yes – I have returned to practice	28 (1%)	19/28 (67.9%)	5/28 (17.9%)
Other	37 (1.4%)	26/37 (70.3%)	5/37 (13.5%)

Data are presented as n (%).

**Table 3:**

Univariate analysis of high risk for burnout and burnout syndrome

Variable	High Risk for Burnout			Burnout Syndrome			P-value
	Yes (N = 1,827)	No (N = 871)	P-value	Yes (N = 510)	No (N = 2,188)	P-value	
<b>Region</b>							
East North Central (IL, IN, MI, OH, and WI)	289 (15.8%)	129 (14.8%)		72 (14.1%)	346 (15.8%)		
East South Central (AL, KY, MS, and TN)	97 (5.3%)	27 (3.1%)		35 (6.9%)	89 (4.1%)		
Mid-Atlantic (NY, NJ, and PA)	223 (12.2%)	106 (12.2%)		63 (12.4%)	266 (12.2%)		
Mountain (AZ, CO, ID, MT, NV, NM, UT, and WY)	172 (9.4%)	84 (9.6%)		58 (11.4%)	198 (9.1%)		
New England (CT, ME, MA, NH, RI, and VT)	127 (7%)	59 (6.8%)		28 (5.5%)	158 (7.2%)		
Pacific (CA, OR, WA, AK, and HI)	300 (16.4%)	141 (16.2%)	0.346	82 (16.1%)	359 (16.4%)		0.184
South Atlantic (DE, MD, VA, WV, NC, SC, GA, FL, and DC)	318 (17.4%)	163 (18.7%)		81 (15.9%)	400 (18.3%)		
West North Central (IA, KS, MN, MO, NE, ND, and SD)	113 (6.2%)	70 (8%)		38 (7.5%)	145 (6.6%)		
West South Central (AR, LA, OK, and TX)	178 (9.7%)	85 (9.8%)		50 (9.8%)	213 (9.7%)		
Other	6 (0.3%)	5 (0.6%)		2 (0.4%)	9 (0.4%)		
Prefer not to answer	4 (0.2%)	2 (0.2%)		1 (0.2%)	5 (0.2%)		
<b>Subspecialty</b>							
Cardiothoracic	188/1,817 (10.4%)	93/868 (10.7%)		57/508 (11.2%)	224/2,177 (10.3%)		
Critical Care	67/1,817 (3.7%)	20/868 (2.3%)		20/508 (3.9%)	67/2,177 (3.1%)		
General	1,083/1,817 (59.6%)	499/868 (57.5%)		318/508 (62.6%)	1,264/2,177 (58.1%)		
Neuroanesthesiology	36/1,817 (2%)	16/868 (1.8%)		10/508 (2%)	42/2,177 (1.9%)		
OB	60/1,817 (3.3%)	33/868 (3.8%)	0.1	18/508 (3.5%)	75/2,177 (3.5%)		0.220
Pain	42/1,817 (2.3%)	21/868 (2.4%)		9/508 (1.8%)	54/2,177 (2.5%)		
Peds	201/1,817 (11.1%)	118/868 (13.6%)		46/508 (9.1%)	273/2,177 (12.5%)		
Regional	92/1,817 (5.1%)	33/868 (3.8%)		19/508 (3.7%)	106/2,177 (4.9%)		
Other	48/1,817 (2.6%)	35/868 (4%)		11/508 (2.2%)	72/2,177 (3.3%)		
<b>Time since training complete (years)</b>	16 (9.25)	20 (12.30)	<0.001*	14 (8.20)	18 (10.28)		<0.001*
<b>&gt;40 Hours working in an average week</b>	1,645 (90%)	681 (78.2%)	<0.001*	472 (92.6%)	1854 (84.7%)		<0.001*

Variable	High Risk for Burnout			Burnout Syndrome		
	Yes (N = 1,827)	No (N = 871)	P-value	Yes (N = 510)	No (N = 2,188)	P-value
<b>Anesthesia staffing shortages experienced in past month</b>						
Not at all/a little	281 (15.4%)	302 (34.7%)	<0.001*	80 (15.7%)	503 (23%)	<0.001*
A moderate amount/a lot/a great deal	1,546 (84.6%)	569 (65.3%)		430 (84.3%)	1685 (77%)	
<b>Feeling supported in work-life</b>						
Not at all/a little	1,182 (64.7%)	226 (26%)	<0.001*	393 (77.1%)	1015 (46.4%)	<0.001*
A moderate amount	521 (28.5%)	345 (39.6%)		97 (19%)	769 (35.2%)	
A lot/a great deal	124 (6.8%)	300 (34.4%)		20 (3.9%)	404 (18.5%)	
<b>Feeling supported in out-of-work life</b>						
Not at all/a little	500 (27.4%)	118 (13.6%)	<0.001*	172 (33.7%)	446 (20.4%)	<0.001*
A moderate amount	524 (28.7%)	230 (26.4%)		158 (31%)	596 (27.2%)	
A lot/a great deal	803 (44%)	523 (60.1%)		180 (35.3%)	1146 (52.4%)	
<b>Caregiving responsibilities</b>						
No	474 (25.9%)	308 (35.4%)	<0.001*	117 (22.9%)	665 (30.4%)	0.001*
Yes	1,353 (74.1%)	563 (64.6%)		393 (77.1%)	1,523 (69.6%)	
<b>Gender Identity</b>						
Female	611/1,777 (34.4%)	260/850 (30.6%)		178/499 (35.7%)	693/2,128 (32.6%)	
Male	1,099/1,777 (61.9%)	565/850 (66.5%)	0.013*	297/499 (59.5%)	1,367/2,128 (64.2%)	0.079
Other	31/777 (0.2%)	5/850 (0.6%)		1/499 (0.2%)	7/2,128 (0.3%)	
Prefer not to answer	64/1,777 (3.6%)	20/850 (2.4%)		23/499 (4.6%)	61/2,128 (2.9%)	
Age < 50 years	940/1,760 (53.4%)	336/839 (40.1%)	<0.001*	307/493 (62.3%)	969/2,106 (46%)	<0.001*
<b>Identify as underrepresented on the basis of race</b>						
	184/1,648 (11.2%)	81/797 (10.2%)	0.455	52/462 (11.3%)	213/1,983 (10.7%)	0.749
<b>Identify as underrepresented on the basis of religion</b>						
	74/1,648 (4.5%)	37/797 (4.6%)	0.866	19/462 (4.1%)	92/1,983 (4.6%)	0.624
<b>Identify as underrepresented on the basis of LGBTQIA+ status</b>						
	66/1,648 (4%)	20/797 (2.5%)	0.06	19/462 (4.1%)	67/1,983 (3.4%)	0.441
<b>Identify as underrepresented on the basis of ESL</b>						
	94/1,648 (5.7%)	40/797 (5%)	0.485	16/462 (3.5%)	118/1,983 (6%)	0.034*

Continuous data are presented as median (interquartile range) and categorical data are presented as n (%).

The Wilcoxon rank sum test and Chi-square test were used to compare the two groups on continuous and categorical variables, respectively.

\* Statistically significant.

LGBTQIA+, Lesbian, gay, bisexual, queer/questioning, intersex, and asexual status

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