

# Parental Leave in Neurosurgery: A US Cross-Sectional Study

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**BACKGROUND AND OBJECTIVES:** The Accreditation Council for Graduate Medical Education implemented a minimum of 6 weeks parental leave for residents in July 2022. The implementation and impact have not previously been studied in neurosurgery. Our primary study objectives were to determine whether an institution had a parental leave policy and quantify the Family and Medical Leave Act (FMLA) and total parental leave (TPL) time taken by neurosurgeons.

**METHODS:** We conducted a cross-sectional survey (August 2023 to December 2023) of neurosurgeons (residents and faculty) in Accreditation Council for Graduate Medical Education–accredited programs. We elicited demographic information, experience with parental leave, and career satisfaction. Association between continuous variables was evaluated using Pearson’s correlation. Data distribution was evaluated using the Shapiro–Wilks test. Central tendency comparison was performed using one-way analysis of variance, Kruskal–Wallis, or Mann–Whitney *U* tests.

**RESULTS:** There were 147 anonymous survey respondents (response rate 15.7%), with an average age of 41 years. The majority (72.2% and 73%) were female and married. The mean age of first pregnancy was 32 years. On average, female residents and faculty took more TPL (7.7 weeks vs 9.0 weeks) and FMLA (6.0 weeks vs 6.8 weeks) than men (resident TPL: 2.0 weeks, FMLA: 1.5 weeks. faculty TPL: 2.1 weeks, FMLA: 1.6 weeks). There was a significant difference between how much parental leave leadership believe residents have vs amount of FMLA (*P*-value = .004) and TPL (*P*-value = .001) residents took. There was a correlation between age and the amount of TPL (Pearson’s *R* = −0.307, *P*-value = .009).

**CONCLUSION:** Our survey demonstrates that neurosurgeons, in general, took less than the minimum suggested leave. Departmental leadership perceived that residents took more leave than they reported. This study highlights an opportunity to increase support for parental leave among neurosurgeons.

**KEY WORDS:** Parental leave, Maternal leave, Neurosurgery leave, Pregnancy in surgery

The ability to have a family and maintain work-life balance has a strong impact on specialty choice.<sup>1,2</sup> This disproportionately affects women, who make up over half of graduating medical classes in the United States but have long been under-represented in surgical specialties.<sup>3–5</sup>

The recruitment rate of women into neurosurgery has seen some increase over time, but recent data reveal that it falls short of a previously identified goal of the American Association of

Neurological Surgeons.<sup>6,7</sup> In 2022, ambitious goals were set for further growth: women comprising 30% of entering residents by 2030 and 30% of practicing neurosurgeons by 2038.<sup>7</sup> Achieving such benchmarks will require addressing barriers faced by women in neurosurgery. A key factor influencing the recruitment of female medical students, resident retention, and faculty success<sup>1</sup> is starting a family.<sup>8–12</sup> While training programs increasingly have a parental leave policy and the Accreditation Council for Graduate Medical Education (ACGME) implemented a minimum of 6 weeks parental leave in July 2022, these policies may not adequately meet the needs of new parents.<sup>8,10,11,13,14</sup>

Currently, the US Family and Medical Leave Act (FMLA)<sup>15</sup> provides some employees with up to 12 weeks of unpaid, job-

**ABBREVIATIONS:** ACGME, Accreditation Council for Graduate Medical Education; FMLA, Family and Medical Leave Act; TPL, total parental leave

protected leave per year. However, there is a lack of clarity and consistency with regard to institutional parental leave and return-to-work policies relating to women as trainees and faculty in surgical specialties.<sup>16</sup>

The study objectives were to identify and summarize the status of parental leave in neurosurgery and to provide evidence for recommendation on parental leave policies during training and faculty years.

## METHODS

We conducted a cross-sectional survey of neurosurgical faculty and residents in the United States. Data were collected from August 2023 to December 2023 and managed using Research Electronic Data Capture<sup>17</sup> tools hosted at our institution. We piloted the survey with surgical faculty and trainees for content evaluation. We included participants who were enrolled in an ACGME-accredited program or were an active board-eligible or board-certified neurosurgeon. The study protocol was reviewed and approved by the institutional review board. Participants provided online consent before continuing with survey completion.

We abstracted information on individual characteristics, marital status, childcare type, geography, career status, job satisfaction, reproductive history, and experience with parental leave. We defined FMLA as the amount of protected time taken as defined by the US Department of Labor.<sup>15</sup> We measured total parental leave (TPL) as the total amount of time taken off work in weeks when considering FMLA and any additional eligible leave based on participants' state or employer.

Career stage was analyzed as a categorical variable and collected from separate questions ("Are you a resident or a faculty member," "Are you in a leadership position"). Residents were separated into junior, mid-level, or senior for years 1 to 3, 4 to 5, and 6 to 7, respectively, during the career stage analysis. The type of childcare was elicited (live-in care, daytime nanny, daycare, family, work from home partner, other) including whether participants had employer-offered on-site/nearby childcare and/or emergency childcare services.

Participants were asked if they felt pressure to return to work sooner than they were ready. Among participants who answered yes, we elicited factors that contributed to the pressure (reduced pay, shame of taking too much time off, fear of losing established practice, missing work, potential need to make up training at the end of chief year, other).

Participants were asked if they held a leadership role (chairperson, vice chairperson, program director, or associate program director). Those who answered "yes" were asked if there was a well-established parental leave policy at their program for residents and faculty. For analysis, leave amount for those who answered "no" was listed as zero weeks, whereas those who answered "unsure" were omitted from the analysis. They were further asked the amount of leave residents and faculty can take after the birth of a child and if residents needed to make up time at the end of training. We measured career satisfaction using a six-point Likert scale.

We collected experience of those who provided coverage using seven-point Likert scales by asking the amount of time in weeks that was enough for parental leave. We abstracted information on changes to their schedule, workload, and burnout. Burnout was defined using the American Medical Association definition for burnout.<sup>18</sup>

To reduce selection bias, the survey was distributed widely using Women in Neurosurgery listserv, Congress of Neurological Surgeons e-mail directory, social media, and word of mouth.

## Statistical Analysis

We conducted all analyses in Python 3.8.10 (Python Software Foundation).<sup>19</sup> Statistical tests were undertaken using SciPy modules.<sup>20</sup> Only participants with completed surveys were included in the statistical analysis.

Geographic US regions were grouped as defined by the National Geographic Regions of the United States.<sup>21</sup> Figures were created using Matplotlib<sup>22</sup> and Seaborn modules.<sup>23</sup>

Pearson's correlation coefficient was used to compare the association between continuous variables. Central tendency comparison between groups was performed using 1-way analysis of variance, Kruskal–Wallis, or Mann–Whitney *U* tests. Nonparametric distribution was confirmed using a Shapiro–Wilks test. Dunn post hoc test with a Bonferroni correction was used to determine pairwise differences.

## RESULTS

The survey was initiated by 147 participants with a 15.7% response rate. Most (*n* = 116) consented and proceeded with the survey. Three participants had incomplete survey responses. Our final analytic sample included 113 participants with completed surveys.

### Participant Characteristics

The average age of respondents was 41 years (26–73 years), and 72.4% was female. Most were married (73.3%), whereas 19.0% was single and 4.3% divorced. Among the cohort, 39.5% was residents and 60.5% was attendings. Most of the attendings (66.2%) had been practicing for more than 5 years. More than half (62.6%) of the respondents had a child. Many pregnancies were by spontaneous conception (90.3% [*n* = 65]), with a smaller proportion using assisted reproductive technologies (6.9% in vitro fertilization and 1.4% by surrogacy). The median and mean age of first pregnancy was 32 years. Most of the participants (63.9%) had more than one child and were board-certified (61.1%), with 79.2% of board-certified participants noting that having children did not delay the process to board certification.

### Parental Leaves: Female vs Male

With regard to FMLA, female residents (6.0 vs 1.5 weeks, *P* = .037) and faculty (6.8 vs 1.6 weeks, *P*-value <.001) on average took more time than male residents and faculty. The same was true for TPL. Female residents (7.7 vs 2.0 weeks *P* = .006) and faculty (9.0 vs 2.1 weeks, *P*-value <.001) on average took more TPL than male residents and faculty (Table and Figure 1).

### Parental Leave Relative to Participant Age

Participant age was reviewed for trends in the amount of parental leave taken over different generations of surgeons. There was a correlation between TPL and participant age (Pearson's *R* -0.307, *P*-value 0.009) with decreasing TPL as age increases. There was no correlation with FMLA (Figures 2 and 3).

**TABLE. Weeks of Parental Leave Taken by Neurosurgery Residents and Faculty in the United States (n = 113)**

Variable	Count	Total parental leave (wk)		Family Medical Leave Act (wk)	
		Mean ( $\pm$ SD)	Min/Max	Mean ( $\pm$ SD)	Min/Max
Total, age = 41.1 years (10.5)	113				
Leadership <sup>a</sup> views for faculty	20	7.1 ( $\pm$ 6.97)	0/24	n/a	
Leadership <sup>a</sup> views for residents	20	6.1 ( $\pm$ 5.52)	0/16	n/a	
<b>Male/female status</b>					
Male resident	4	2.0 ( $\pm$ 1.15)	1/3	1.5 ( $\pm$ 1.73)	0/3
Female resident	15	7.7 ( $\pm$ 2.81)	2/13	6.0 ( $\pm$ 3.68)	0/12
Male faculty	20	2.1 ( $\pm$ 2.60)	0/12	1.6 ( $\pm$ 2.70)	0/12
Female faculty	33	9.0 ( $\pm$ 4.88)	0/28	6.8 ( $\pm$ 4.14)	0/12
<b>Regions</b>					
Midwest	14	4.2 ( $\pm$ 3.30)	1/12	3.2 ( $\pm$ 3.62)	0/12
Northeast	13	7.0 ( $\pm$ 4.28)	1/16	4.7 ( $\pm$ 4.28)	0/12
Southeast	17	5.8 ( $\pm$ 4.34)	0/13	5.2 ( $\pm$ 4.4)	0/12
Southwest	7	5.9 ( $\pm$ 3.84)	0/10	5.4 ( $\pm$ 3.74)	0/10
West	13	6.0 ( $\pm$ 4.47)	0/12	4.7 ( $\pm$ 4.36)	0/12
<b>Does your place of employment offer any emergency childcare services?</b>					
No	37	7.8 ( $\pm$ 4.87)	1/28	6.6 ( $\pm$ 3.93)	0/12
Not sure	19	4.3 ( $\pm$ 4.51)	0/12	3.3 ( $\pm$ 4.01)	0/12
Yes	16	5.7 ( $\pm$ 4.68)	1/16	3.1 ( $\pm$ 3.95)	0/12
<b>Career stage</b>					
Faculty	53	6.4 ( $\pm$ 5.36)	0/28	4.9 ( $\pm$ 4.43)	0/12
All residents	24	6.5 ( $\pm$ 3.48)	1/13	5.0 ( $\pm$ 3.82)	0/12
Junior	4	7.0 ( $\pm$ 4.69)	1/12	3.7 ( $\pm$ 4.5)	0/9
Mid	7	6.3 ( $\pm$ 3.19)	1/10	5.8 ( $\pm$ 3.38)	0/10
Senior	8	6.5 ( $\pm$ 3.58)	2/13	5.0 ( $\pm$ 4.17)	0/12

<sup>a</sup>Leadership includes those who answered yes/no to the presence of a well established parental leave policy in their program

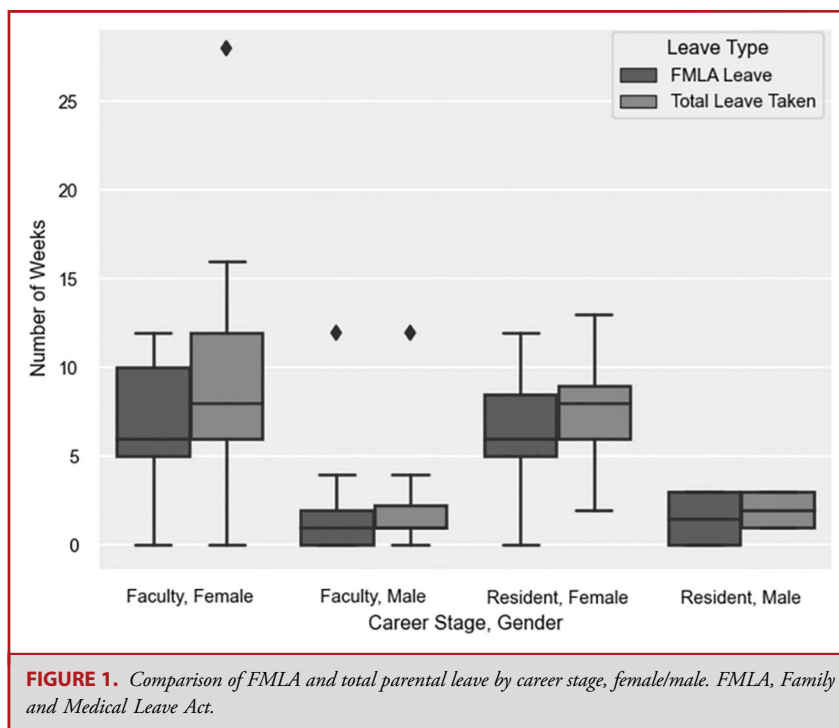
## Parental Leave vs Career Stage, Delivery, and Conception Type

Many of the participants were attendings (54.2%) during the most recent pregnancy or childbirth experience. The mean FMLA and TPL for residents were 5.0 and 6.5 weeks respectively. For faculty, the mean FMLA was 4.9 weeks and 6.4 weeks for TPL (Table). There was no statistically significant difference in the amount of FMLA leave taken ( $P$ -value = .824) or TPL taken ( $P$ -value = .952) based on career stage (Figure 4). Delivery mode and conception methods were assessed as covariates. There was no significant difference in FMLA or TPL based on the delivery

method (vaginal, planned cesarean section, unplanned cesarean section) (FMLA:  $P$ -value = .33; TPL:  $P$ -value = .69) or the conception method (FMLA:  $P$ -value 0.31; TPL:  $P$ -value = .14).

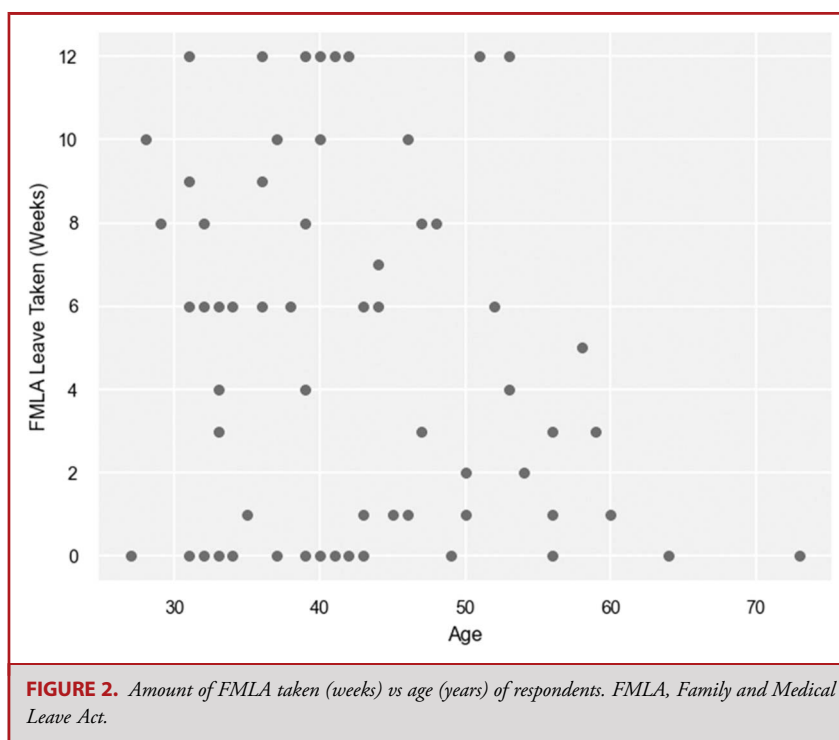
## Factors Influencing Early Return from Parental Leave

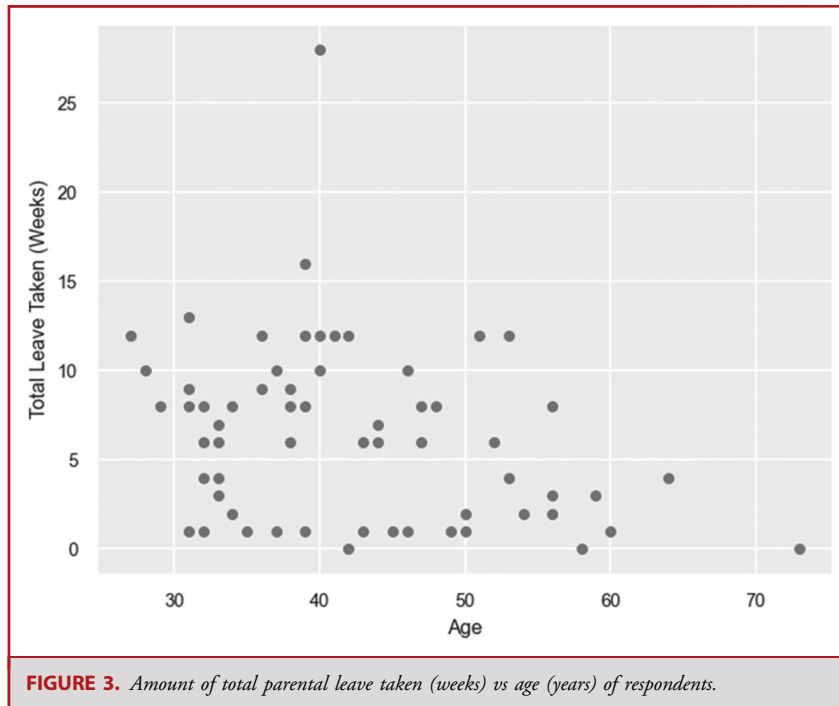
For resident participants, 75% felt pressure to return to work sooner than they were ready. The most common reason was “shame of taking too much time off” (93.3%) followed by “missing work” (73.3%) and “potential need to make up training at the end of chief year” (66.7%). For faculty participants, 49.1% felt pressure to return to work sooner than they were ready. The



most common reason was “shame of taking too much time off” (57.7%) followed by “missing work” (50%), “reduced pay” (42.3%), and “fear of losing established practice” (34.6%).

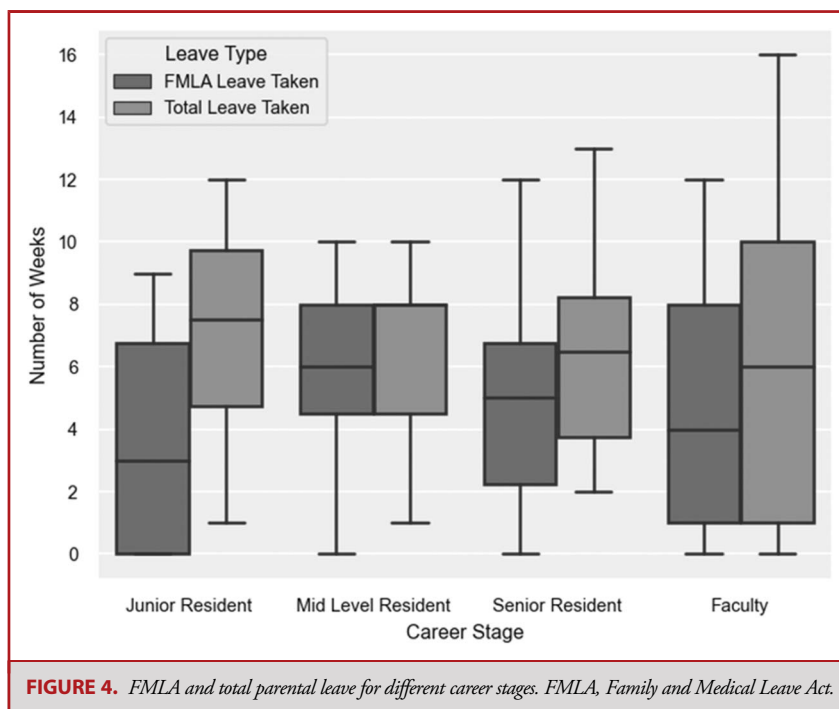
There was no significant difference in FMLA and TPL based on the type of childcare but a significant difference based on availability of employer-offered emergency childcare services (FMLA

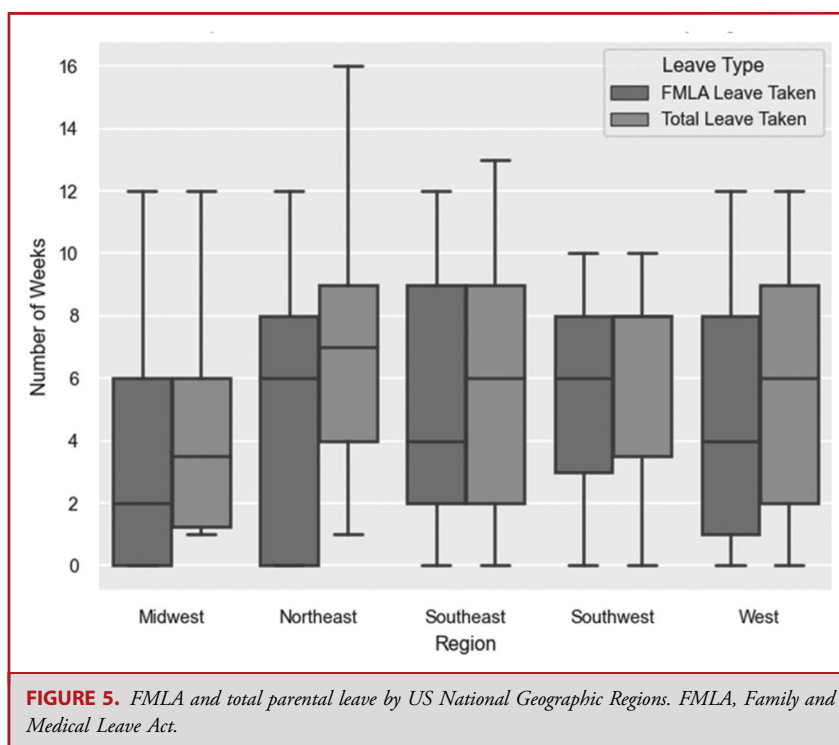




$P$ -value: .003; TPL  $P$ -value: .019). Post hoc testing showed a significant difference in FMLA for those who answered “yes” ( $P$ -value: .012) or “not sure” ( $P$ -value: .018) compared with those who answered “no” (Table). Post hoc analysis for TPL showed a

statistically significant difference between those who answered “not sure” and those who answered “no.” There was no significant difference in TPL between those who answered “yes” and those who answered “no.”





### Parental Leave Based on US Regions

We did not identify significant differences in leave based on the US region. Ten respondents who practiced in multiple states and one respondent from “Other” region were excluded. There was no significant difference for either FMLA ( $P$ -value = .43) or TPL ( $P$ -value = .34; Figure 5) (Table).

### Perception of Parental Leave Policy: Leadership vs Residents and Faculty

There were 24 participants (34.8%) with leadership roles. Overall, 84.6% of leadership answered “no” when asked whether residents needed to make up time off at the end of training. This contrasts with 66.7% of trainees reporting concerns about making up time at the end of training, as a reason for taking less parental leave.

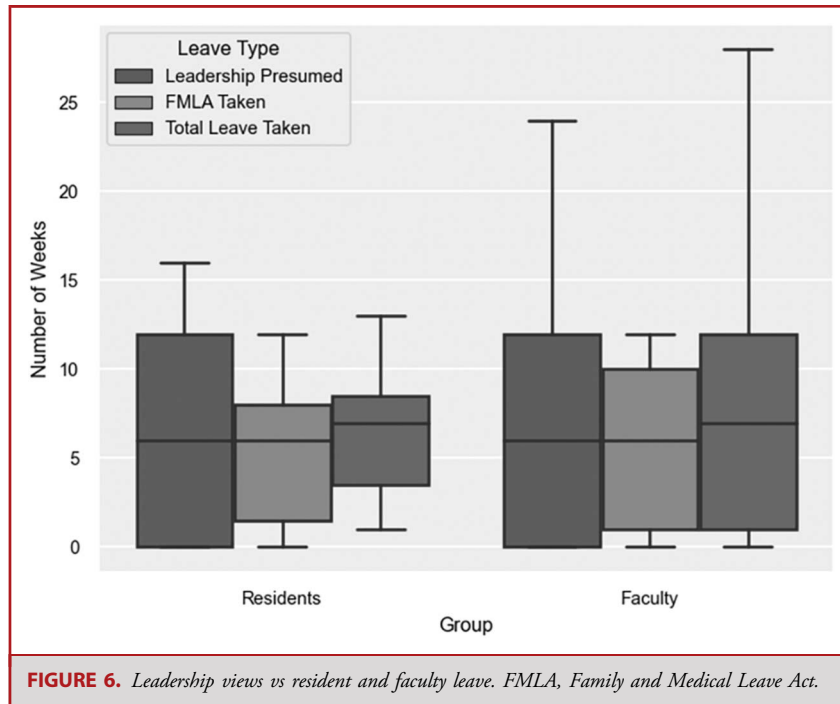
Of those with leadership roles, 54.2% noted having a well-established parental leave policy in their program for residents and faculty, whereas 29.2% answered “no” and the remainder were unsure. Among respondents with a parental leave policy, participants with a leadership role believe that residents have more protected leave than the amount of FMLA ( $P$ -value: .004) and TPL residents take ( $P$ -value: .001). Leaders reported a mean of 6.1 weeks leave, whereas residents took an average of 5.0 weeks of FMLA and 6.5 weeks of TPL. There was no significant difference between leadership views and faculty FMLA amount ( $P$ -value = .437) or TPL amount ( $P$ -value = .196; Figure 6).

### Career Satisfaction

Most of the participants (81.7%) are extremely or very satisfied with their career choice. Most are also (30.4%) extremely or very satisfied with their family and personal time relative to their amount of work, whereas 20.8% is very or extremely dissatisfied, with 24.3% somewhat satisfied or somewhat dissatisfied.

### Opinions of Colleagues Covering During Parental Leave

There were 39 participants who did not have children but had provided coverage for a colleague on parental leave during their training or career. The average amount of “enough time for parental leave” noted by these covering colleagues was 11.59 weeks (SD 8.78, range 3-52 weeks), whereas the median was 12 weeks. Most (35 %) strongly agreed or agreed that their schedule changed for the worse during the time their colleague was away, whereas 17.9% somewhat agreed, 15.4% disagreed, and 2.6% strongly disagreed. Most (53.8%) strongly agreed or agreed that the workload was distributed fairly, whereas 12.8% disagreed or strongly disagreed. Most (51.2%) disagreed or strongly disagreed that they experienced burnout. When asked about having to stay later or come in earlier to complete workload during the time their colleague was away, 48.7% somewhat agreed, agreed, or strongly agreed. When asked if the time taken by their colleague was excessive, most (87.1%) either disagreed or strongly disagreed.



## DISCUSSION

### Key Results

Our study shows that female residents and faculty on average take more TPL compared with their male counterparts. It also showed that a high mean age of first pregnancy for the child-bearing participants was 32 years.

Many factors influence the amount of parental leave taken like those found in this study.<sup>24</sup> For residents, there are potential training implications with 66.7% of those who felt pressured to return to work sooner noting concern about needing to make up training at the end of chief year. The perception of surgical specialties not being compatible with having a family has been shown in multiple studies.<sup>10,25</sup> Female practicing physicians have a clear influence on the imagery painted of the specialty to medical students seeking compatible careers.<sup>2,9,26</sup> To that end, to recruit more females into neurosurgery, we must also focus on lifestyle factors that are of importance to those currently within the field. In addition, to reduce exposure to and risk of bias in hiring practices,<sup>27</sup> it is imperative that men in neurosurgery are encouraged if not required to take parental leave after the birth/adoption of a child.

Studies have shown a high average age at first pregnancy for female surgeons, 7.4 years above that of the general population.<sup>11,28</sup> This was also found in our study where the average age of first pregnancy for child-bearing participants was 32 years. The increased risk of complications with advanced maternal age has led to an increasing number of women looking to start a family during residency or junior faculty years.<sup>10,11,29</sup> With that in mind, it is imperative that those in leadership are well versed on policies surrounding parental leave. In our study, one

third of leadership noted not having a well-established parental leave policy for residents and faculty in their program, whereas 16.7% was uncertain. The discordance found in this study between leadership and residents' take on parental leave has been shown in similar studies.<sup>30,31</sup> In July 2022, the ACGME implemented a new institutional requirement of a minimum of 6 weeks of paid parental leave.<sup>14</sup> This concept of minimum parental leave policy for residents is not new and was adopted much earlier by other specialties.<sup>32</sup> In this study, we showed a low amount of TPL in male residents that differs from the recommended minimum 6 weeks by ACGME. Overall, the role leadership plays in determining the culture of acceptance of parental leave in neurosurgery is paramount at the program and national level. One step toward improved culture should include creation of a minimum parental leave policy at the program level for faculty and residents alike. When covering colleagues were asked the amount of parental leave that was considered enough, the mean was higher at almost 12 weeks. This might serve as a starting point for a minimum amount of parental leave. In addition, one third of covering colleagues agreed or strongly agreed that their schedule changed for the worse, but more than half agreed or strongly agreed that the workload was fairly distributed, with only a minority 20% agreeing or strongly agreeing that they experienced burnout. This provides some guidance on the structure of coverage with careful attention to workload distribution to minimize burnout.

Our study showed a correlation between age and TPL, but this difference did not hold for FMLA. This might reflect a gradual shift in the culture within. However, it is important to note that there were some participants with zero weeks of FMLA or TPL distributed across different age groups, reflecting that a culture of minimal parental leave persists across era(s).



Our study shows that most of the participants are satisfied with their career choice. Nevertheless, studies have shown low satisfaction scores related to work-life balance for women in surgical specialties.<sup>27,33</sup> We remain faced with a specialty that falls behind in the rate of female medical students entering the field relative to the ratio of female matriculating medical students. To increase the rate of women entering the field, potentially decrease attrition rate, and improve work-life balance, clearer guidelines are needed for parental leave in neurosurgery.<sup>8,27</sup>

## Limitations

This study has limitations inherent to cross-sectional studies including a response bias in the type of participants who took the survey. The reason behind those who started the survey but did not finish it is unclear. The authors acknowledge that the survey fails to capture all experiences because participants were asked to focus on their last/most recent pregnancy-childbirth experience. It also does not capture the experience of fellows, nor does it capture bonding leave, which in some states need not be used immediately after the birth or adoption of a child.

## CONCLUSION

We found persistent variability in parental leave policies in neurosurgery. Departmental leadership perceived that residents took more leave than they reported. This might imply a need for clearer guidelines and policies for a minimum required parental leave for residents and faculty in neurosurgery. This study serves as a guide for future studies assessing barriers to minimum parental leave policies at the program and national neurosurgery level.

## Generalizability

The wide survey distribution allowed for representation from the different regions of the United States. However, the small sample size limits result generalizability.

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