

Global parental leave in surgical careers: differences according to gender, geographical regions and surgical career stages

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#Globalmentors- surgical diversity team

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Abstract

Background: There is a lack of information regarding the provision of parental leave for surgical careers. This survey study aims to evaluate the experience of maternity/paternity leave and views on work–life balance globally.

Methods: A 55-item online survey in 24 languages was distributed via social media as per CHERRIES guideline from February to March 2020. It explored parental leave entitlements, attitude towards leave taking, financial impact, time spent with children and compatibility of parenthood with surgical career.

Results: Of the 1393 (male:female, 514:829) respondents from 65 countries, there were 479 medical students, 349 surgical trainees and 513 consultants. Consultants had less than the recommended duration of maternity leave (43.8 versus 29.1 per cent), no paid maternity (8.3 versus 3.2 per cent) or paternity leave (19.3 versus 11.0 per cent) compared with trainees. Females were less likely to have children than males (36.8 versus 45.6 per cent, $P=0.010$) and were more often told surgery is incompatible with parenthood (80.2 versus 59.5 per cent, $P<0.001$). Males spent less than 20 per cent of their salary on childcare and fewer than 30 hours/week with their children. More than half (59.2 per cent) of medical students did not believe a surgical career allowed work–life balance.

Conclusion: Surgeons across the globe had inadequate parental leave. Significant gender disparity was seen in multiple aspects.

Additional content

An author video to accompany this article is available at: <https://oup.cloud.panopto.eu/Panopto/Pages/Sessions/List.aspx#folderID=%22cecaf919-7e86-43a9-adc3-ad1700a2f629%22>

Introduction

Over recent decades, the proportion of female medical students^{1–4}, doctors^{5,6} and surgeons^{6–9} has increased across the globe. Despite the growing female medical workforce, surgery remains the most male-dominated (88 per cent) specialty with the lowest proportion of female doctors in training (32 per cent) in the UK⁶. Medical students may be dissuaded from pursuing surgery as they perceive surgical careers to be incompatible with family life¹⁰ and would not allow a balanced lifestyle¹¹.

Studies from the USA showed that childbearing has increased amongst surgical residents¹² but pregnancy during training is thought to have negative impacts on mothers' and children's health^{13–16}, with duration of maternity leave believed to be inadequate¹³. Stigma is still common with two out of three women stating that their childbearing decision has been negatively influenced by peers and faculty¹⁷. This is echoed by 60 per cent of US surgical programme directors who believe that motherhood negatively affects a trainee's work¹⁸. Until now, the predominant focus has been on maternity leave but recently the importance of paternity leave has been increasingly recognised. It has been demonstrated that fathers who take paternity leave are more involved in subsequent childcare¹⁹ and have strengthened bonds with their children²⁰.

Flexible and supportive workplace policies are vital in making surgery a more family-friendly specialty to attract and retain talents. There are very limited studies on maternity/paternity leave policies for surgeons and these mainly focus on one country^{13,21,22}. Only one study has surveyed maternity leave policy for surgeons internationally but it has not evaluated the provision of paternity leave²³.

Methods

Design and content of surveys

A 55-item open survey in English was created. Items were chosen by literature review and created to assess specifics of maternity/paternity leave provision. The survey was shared among the participating members on Slack, a cloud-based collaborative platform, for refinement. Depending on their self-reported stage of training (*Appendix S1*), the respondents were directed to the

medical student, surgical trainee or those who have completed training (abbreviated to consultants) part of the survey.

The student survey, consisting of 11 specific questions, included questions on the participant's interest in a surgical career; their views on work–life balance, part-time/flexible training and compatibility of parenthood with a surgical career; and the availability of legislation regarding maternity/paternity leave in their country (*Appendix S2*).

Each of the surgical trainee and surgical consultant parental leave surveys consisted of the same 18 questions, but with wording adjusted to suit the different stages of career (*Appendices S3* and *S4*). They included questions on the availability of legislation regarding maternity/paternity leave in their country; their leave entitlement; their views on covering colleagues for maternity/paternity leave; work–life balance (with 'too much work' defined as a score of 0–3; 'neutral' defined as a score of 4–6; and 'too much family time' defined as a score of 7–10) and compatibility of parenthood with a surgical career.

Trainees who had become a parent during training or consultants who had become a parent whilst being a consultant in the last 5 years were additionally asked about workplace attitude towards their taking of maternity/paternity leave, reasons for not taking full entitlement and the ease of their maternity/paternity leave application ('easy' if respondent has answered that the leave policy is being used without issue or without prejudice and 'not easy' if respondents answered that they have been 'frowned upon when applying' or there is 'much hindrance when applying' or 'leave policy is not available').

All trainee and consultant respondents who had children were also asked about time spent with children, childcare arrangements and financial impact of childcare.

The online survey was created on www.smartsurvey.co.uk, in accordance with the Checklist for Reporting Results of internet E-survey (CHERRIES) guideline (*Appendix S5*). It was translated into 23 languages, including Arabic, Azerbaijani, Chinese (simplified and traditional), Czech, Danish, Dutch, Farsi, French, German, Greek, Italian, Japanese, Malay, Norwegian, Polish, Portuguese, Russian, Slovak, Spanish (European and Latino), Turkish and Urdu. The translation of each language was performed and verified by at least two native-speaking authors.

The aims of the survey were explained and completion of the survey inferred consent. The items were not randomized but adaptive, with a maximum of 26 items which required answering. A survey was deemed complete when respondents arrived at

Table 1 Demographics

	Overall (n = 1393)	Students (n = 479)	Trainees (n = 349)	Consultants (n = 513)
Age (years)*	29.5 (13)	22 (4)	29 (5)	39 (10.5)
Sex				
Female	829 (61.5)	353 (73.8)	205 (59.1)	263 (51.6)
Male	514 (38.1)	123 (25.7)	141 (40.6)	245 (48.0)
Non-binary	3 (0.2)	1 (0.2)	1 (0.3)	1 (0.2)
Prefer not to say	2 (0.1)	1 (0.2)	0 (0)	1 (0.2)
Marital status				
Single	400 (29.6)	260 (54.3)	90 (25.9)	48 (9.4)
In a relationship	317 (23.5)	174 (36.3)	93 (26.7)	50 (9.8)
Married	613 (45.4)	44 (9.2)	164 (47.1)	398 (77.7)
Divorced	16 (1.2)	0 (0)	1 (0.3)	13 (2.5)
Widowed	4 (0.3)	1 (0.2)	0 (0)	3 (0.6)
Number of children†				
0	819 (60.8)	458 (95.8)	221 (63.7)	135 (26.5)
1–2	434 (32.2)	18 (3.7)	112 (32.3)	299 (58.7)
3–4	86 (6.4)	2 (0.4)	14 (4.0)	68 (13.4)
>4	7 (0.5)	0 (0)	0 (0)	7 (1.4)
Age of having first child (years)				
<25	42 (3.3)	8 (1.8)	9 (2.8)	23 (4.6)
26–30	211 (16.5)	17 (3.9)	67 (20.7)	125 (25.2)
31–35	208 (16.3)	6 (1.4)	46 (14.2)	152 (30.6)
36–40	80 (6.3)	0 (0)	10 (3.1)	68 (13.7)
>41	14 (1.1)	0 (0)	3 (0.9)	11 (2.2)
N/A	725 (56.6)	408 (92.9)	198 (61.1)	117 (23.6)
Partner's occupation				
N/A	394 (29.4)	236 (50.1)	93 (27.0)	62 (12.1)
Surgeon	142 (10.6)	6 (1.3)	39 (11.3)	94 (18.4)
Medical but not surgeon	211 (15.8)	18 (3.8)	65 (18.8)	127 (24.9)
Medical student	65 (4.9)	60 (12.7)	4 (1.2)	1 (0.2)
Non-medical	482 (36.0)	148 (31.4)	138 (40.0)	191 (37.4)
Homemaker	45 (3.4)	3 (0.6)	6 (1.7)	36 (7.0)

Values in parentheses are percentages unless indicated otherwise; *values are median (i.q.r.). †Binary comparison between trainee and consultants, trainees were significantly less likely to have children than consultants ($P < 0.001$). N/A, Not answered.

the last page and clicked the 'Finish Survey' button. Due to its open nature, there was no mechanism to ensure that only the target population were answering.

Dissemination of the survey

The survey was disseminated via social media, including Facebook and Twitter, and through emails to medical student societies, surgical societies and women's surgical societies around the world (Appendix S6) from 22 February 2020 for 6 weeks. The survey was terminated prematurely on 28 March 2020 due to the COVID-19 pandemic. Participation in the survey was voluntary and no incentives were offered for its completion. No personally identifiable information was collected.

Analysis of surveys

Only complete surveys were analysed. Responses from all duplicated IP addresses were checked manually. If they were different, they would be assumed to be from different visitors with the same modem.

Statistical analysis was performed using SPSS Statistics Version 26 (IBM, Chicago, Illinois, USA). Normality of data was checked by visual inspection of histograms, or by Anderson–Darling test and Shapiro–Wilk test. Non-parametric data were reported as median (i.q.r.). χ^2 tests were used to compare categorical and ordinal variables, with significance level set at $P < 0.050$.

Results

A total of 1894 responses were received and 1393 (73.5 per cent) of them were complete. The full extent of survey dissemination is unknown, thus a formal response rate could not be ascertained. Eighty-nine responses originated from the same IP addresses and were from 25 modems. Each of these responses with duplicated IP addresses was cross-checked and found to be different from every other response and were thus included in the analysis.

Overall, the median age of the respondents was 29.5 (i.q.r. 24–37) years, 829 (61.5 per cent) were female and 527 (39.1 per cent) had children (Table 1). The respondents were spread across 65 countries and six continents with the majority of respondents from Europe (57.9 per cent) and Asia (34.6 per cent) (Table S1). The countries with the greatest number of respondents were Turkey (180, 13.3 per cent), Switzerland (175, 13.0 per cent), Denmark (150, 11.1 per cent), Japan (112, 8.3 per cent) and the UK (87, 6.5 per cent).

In terms of stage of career, 479 (34.4 per cent) of the respondents were medical students, 349 (25.1 per cent) were surgical trainees and 513 (36.8 per cent) were consultants. Fifty-two respondents (3.7 per cent) did not provide an answer as to their stage of career and were therefore excluded from subsequent analysis.

Legislation for maternity/paternity leave

There were 1161 (83.3 per cent) respondents who stated that legislation was in place to govern maternity/paternity leave in their country while 131 (9.4 per cent) did not know if such legislation existed. Respondents from Asian countries were statistically more likely to answer that there was no legislation in place for parental leave compared with their counterparts in European countries ($P < 0.001$). There was a significant difference in the lack of knowledge of such legislation across career stages (18.6 per cent of students versus 5.2 per cent of trainees versus 4.7 per cent of consultants, $P < 0.001$).

Medical student survey

The median age of the medical students was 22 (i.q.r. 20–24) years and 353 (73.8 per cent) were female (Table 1). A total of 326 (68.0 per cent) respondents were interested in a career in surgery. However, 397 (83.1 per cent) had never received any formal surgical career advice, and 365 (76.2 per cent) felt that work–family life balance is important/very important in choosing a career. More than half (283 (59.2 per cent)) did not believe that a surgical career allowed such a balance and 226 (47.3 per cent) believed pursuing a surgical career would negatively impact on their family planning or engaging in relationships (Table 2). Moreover, 369 (77.4 per cent) stated that they would be more likely to pursue a surgical career if there were an option of part-time/flexible training, but 361 (75.7 per cent) did not know if their desired employer provided such policies. There were no significant gender differences in these views except that female students are more likely to feel that a surgical career would impact negatively on their family planning (49.5 per cent versus 40.7 per cent, $P = 0.003$).

Surgical trainee and consultant surveys

The median ages of surgical trainees and consultants were 29 (i.q.r. 27–32) and 39 (i.q.r. 34.5–45) years respectively. Regarding gender, 59.1 per cent of trainees and 51.6 per cent of consultants were female (Table 1). Trainees were significantly less likely to have children than consultants (36.3 versus 73.5 per cent,

Table 2 Medical students' views on work–family life balance

Importance of work–family life balance in career choice	n	View on whether surgical career allows a good work–family life balance	n	View on whether a surgical career will have impact on family planning/engaging in relationships	n
Not very important	8 (1.7)	Very poor balance	101 (21.1)	Very negative impact	68 (14.3)
Not important	16 (3.3)	Poor balance	182 (38.1)	Negative impact	158 (33.1)
Neutral	90 (18.8)	Neutral	153 (32.0)	Neutral	186 (39.0)
Important	176 (36.7)	Good balance	36 (7.5)	Positive impact	53 (11.1)
Very important	189 (39.5)	Excellent balance	6 (1.3)	Very positive impact	12 (2.5)

Values in parentheses are percentages.

$P < 0.001$). Overall, females were significantly less likely to have children compared with males (45.6 versus 36.8 per cent with no children, $P = 0.010$).

Work–life balance

Too much work was reported by 206 (59.5 per cent) trainees and 265 (52.0 per cent) consultants. There was no significant difference between genders or continents (Europe and Asia) in the work–life balance score.

Views on covering for maternity/paternity leave

A majority of trainees/consultants (670 (85.2 per cent)) stated they were happy or did not mind covering for colleagues on leave. Those with children were significantly more likely to be happy/do not mind covering compared with those without (60.4 versus 39.6 per cent, $P = 0.004$). There was no statistical difference in the feelings regarding covering colleagues on leave in Europe versus Asia (84.3 per cent happy/don't mind to cover in Europe versus 87.6 per cent in Asia, $P = 0.194$; Table S2).

Maternity and paternity leave entitlement

The commonest maternity leave entitlement for trainees was 7–12 months (26.6 per cent) and partially paid (38.4 per cent), while the commonest entitlement for paternity leave was less than 1 month (44.4 per cent) and fully paid (42.1 per cent). For consultants, the commonest entitlement was 1–3 months (35.5 per cent) and partially paid (39.6 per cent) for maternity leave and less than 1 month (44.9 per cent) and fully paid (37.3 per cent) for paternity leave (Table 3).

Of the 235 respondents, 155 (66.0 per cent) found maternity leave application 'easy' while 105 of the 215 respondents (48.8 per cent) found paternity leave application 'easy'. Comparing European and Asian countries, there was no significant difference in the ease of maternity and paternity leave application ($P = 0.071$ and $P = 0.199$ respectively).

Subgroup analysis showed that European trainees were significantly more likely to find maternity leave application 'not easy' compared with Asian trainees (51.5 versus 16.3 per cent, $P = 0.001$). There was no geographical statistical difference amongst consultant maternity leave and paternity leave of trainees/consultants. Full entitlement was not taken by 52.5 per cent (52 of 99) of trainees and 60.7 per cent (82 of 135) of consultants. The commonest reason was pressure from employer/senior/peers followed by financial pressure.

Attitude towards taking maternity/paternity leave

Over 50 per cent of trainees and consultants felt that their employer, seniors and colleagues were supportive or very supportive

of their taking of leave, while at least 8.1 per cent of trainees and 21 per cent of consultants felt unsupported/very unsupported (Table 4).

Childcare

On average, trainees and consultants who had children reported using 1.6 modes of childcare arrangement. The commonest modes of childcare arrangement were help from family and friends (98 of 481 respondents, 20.4 per cent), nursery/school (89 of 481, 18.5 per cent) and a combination of both (79 of 481, 16.4 per cent).

On average, trainees and consultants who had children spent 11–20 per cent of their salary on childcare and school fees (Table 5; Fig. S1). Comparing European and Asian countries, there was no significant difference in the spending on childcare (52.5 per cent in Europe spending less than 20 per cent on childcare versus 58.5 per cent in Asia, $P = 0.209$). Comparing female and male, males were significantly more likely to spend less than 20 per cent of their salary on childcare (47.4 versus 64.2 per cent, $P = 0.000$). There was no significant difference between trainees and consultants (57.9 per cent trainees spending less than 20 per cent on childcare versus 54.8 per cent consultants, $P = 0.545$).

Time spent with children

Of those who had children, 503 (96.7 per cent) of the trainees and consultants answered questions regarding time spent with children. The mean 'time spent with children' was 21–30 hours (Fig. S2). Male surgeons were found to be significantly more likely to spend less than 30 hours per week with their children (73.1 versus 50.4 per cent, $P < 0.005$).

There was no significant difference in the time spent with children between Europe and Asia (60.9 per cent in Europe spent less than 30 hours per week with children versus 60.0 per cent in Asia, $P = 0.855$). Notably, 45 per cent or greater of respondents from Denmark, Japan, Turkey and the UK had spent 30 hours or more with their children per week.

Guilt feeling for not spending enough time with children

Guilt for not spending enough time with their children was reported by 95.6 per cent of trainees and consultants. There was no significant difference between Europe and Asia (94.5 per cent of Europeans versus 95.5 per cent of Asians ever felt guilty, $P = 0.632$).

Compatibility of surgical career with parenthood

A majority of respondents in all categories had been told or heard that a surgical career is not compatible with parenthood (85.4 per cent of the medical students, 80.9 per cent of trainees and 82.0

Table 3 Global maternity and paternity leave entitlement

	Trainees(n = 349)	Consultants(n = 513)
Maternity leave		
Duration		
<1 month	17 (4.8)	24 (4.7)
1–3 months	81 (22.9)	182 (35.5)
4–6 months	76 (21.5)	144 (28.1)
7–12 months	94 (26.6)	45 (8.8)
1–2 years	10 (2.8)	24 (4.7)
>2 years	2 (0.6)	13 (2.5)
Don't know	69 (19.5)	62 (12.1)
No entitlement	5 (1.4)	18 (3.5)
Pay		
Fully paid	118 (33.8)	184 (37.4)
Partially paid	134 (38.4)	195 (39.6)
No pay	7 (2.0)	26 (5.3)
Don't know	86 (24.6)	72 (14.6)
No entitlement	4 (1.1)	15 (3.0)
Paternity leave		
Duration		
<1 month	154 (44.4)	227 (44.9)
1–3 months	42 (12.1)	59 (11.7)
4–6 months	17 (4.9)	11 (2.2)
7–12 months	10 (2.9)	15 (3.0)
1–2 years	2 (0.6)	11 (2.2)
>2 years	1 (0.3)	2 (0.4)
Don't know	90 (25.9)	95 (18.8)
No entitlement	31 (8.9)	86 (17.0)
Pay		
Fully paid	142 (42.1)	182 (37.3)
Partially paid	50 (14.8)	108 (22.1)
No pay	10 (3.0)	27 (5.5)
Don't know	108 (32.0)	104 (21.3)
No entitlement	27 (8.0)	67 (13.7)

Values in parentheses are percentages.

per cent of consultants). There was no significant difference across the different career stages and between Europe and Asia (80.9 versus 83.9 per cent, $P=0.178$). Females were more likely than males to have been told that surgery is not compatible with parenthood (80.2 versus 59.5 per cent, $P<0.001$). Among trainees and consultants, the commonest sources of such comments were from seniors (21.3 and 27.3 per cent respectively) and colleagues (20.3 and 24.1 per cent respectively).

Discussion

This study compared the experience of maternity/paternity leave and parenthood across continents, and between genders for individuals pursuing surgical careers.

The most recent review conducted by UNICEF on 41 high- and middle-income countries revealed that only the USA did not provide for statutory paid maternity/paternity leave²⁴. The International Labour Organization (ILO) recommends at least 14 weeks of maternity leave at a rate of at least two-thirds of previous earnings. It also calls for the development of adequate paid paternity leave without recommending a standard²⁵. Adequate paid parental leave is important as it is associated with lower infant mortality, health benefits of the mother and higher female earnings and employment^{26–28}. There had been a recent trend in enhancing parental leave policies across other sectors. In the UK there is a push towards 6 months of full pay for maternity pay and aligning standalone paternity leave and pay with maternity leave²⁹. Data collected on 107 major US law

firms showed that 80 (74.8 per cent) provided at least 14 weeks of paid primary caregiver leave and 97 (90.7 per cent) provided paid secondary caregiver leave to their lawyers³⁰. Parental leave and pay for surgeons should be aligned with those for other industries.

Similar to previous studies^{16,31,32}, this study demonstrated that female surgeons were significantly less likely to have children than male surgeons. The possible reasons for this might include demands of training as well as infertility³¹ as surgical training coincides with female reproductive years. Another potential reason is that females might have been discouraged to have children as this study revealed as they were more likely to have been told that surgery is incompatible with parenthood, which is echoed by findings of previous studies^{18,33–35}. This, in turn, might have been caused by societal pressure and expectation that women bear greater child-caring responsibilities³⁴. Such gender difference in child-caring responsibilities was highlighted in this study, which found that males were significantly more likely to spend a smaller proportion of their salary on childcare and spend less time with their children.

Overall, trainees were found to be significantly less likely to have children than consultants. Although not directly addressed in the study, potential reasons include trainees being younger and thus less likely to have started a family, difficulty in getting coverage³⁶ and time-off^{37,38}, fear of interruption of training³⁹, inadequate departmental support³⁸ and peer pressure⁴⁰.

This study showed that over 80 per cent of respondents have heard/been told that parenthood was incompatible with a surgical career, suggesting that stigma towards having a family could still be prevalent in a surgical workplace. It also demonstrated that those with children were significantly more likely to be happy or not to mind covering for colleagues on parental leave. This was perhaps because those with children had shared similar experiences and were more likely to be understanding. Although over 85 per cent of respondents were happy or did not mind covering, a significant proportion of respondents still felt unsupported for taking leave. This might be because of deficiency in other crucial factors in the surgical workplace such as clear and concise leave policies, adequate workplace risk assessment during pregnancy, opportunities to keep in touch with the workplace during leave, opportunities for phased/supported return, availability of lactation rooms at work and encouragement of staff to take full leave entitlement.

In addition, this survey showed that over 95 per cent of respondents felt guilty for not spending enough time with their children. This could be improved by more family-friendly policies in the workplace, not limited to enhanced parental leave packages but addressing all aspects of parenthood, such as adequately staffed rotas to allow staff to go home on time or take time off, improving, advertising and normalizing flexible or part-time work and training options for all genders, or on-site round-the-clock nurseries to help staff with childcare. Such policies require enormous political and administrative will and resources to implement. However, they will allow work to fit around family life and improve workforce satisfaction and productivity, and ultimately benefit all healthcare professionals working in the entire healthcare organization.

The majority of medical students felt that work–family life balance is important in choosing a career, as shown in previous studies^{10,11,13,41,42}, and they did not believe that a surgical career allowed such balance. This feeling was echoed by a rather uniform experience from a majority of trainees and consultants that responded 'having too much work'. The students also

Table 4 Attitude towards maternity/paternity leave

Attitude	Trainees (n = 349)	Attitude	Consultants (n = 513)
From deanery		From employer	
Very unsupportive	5 (4.5)	Very unsupportive	19 (11.5)
Unsupportive	5 (4.5)	Unsupportive	17 (10.3)
Neutral	15 (13.6)	Neutral	31 (18.8)
Supportive	19 (17.3)	Supportive	30 (18.2)
Very supportive	41 (37.3)	Very supportive	49 (29.7)
Don't know	21 (19.1)	Don't know	13 (7.9)
N/A	4 (3.6)	N/A	6 (3.6)
From employer		From consultant colleagues	
Very unsupportive	5 (4.5)	Very unsupportive	17 (10.2)
Unsupportive	9 (8.2)	Unsupportive	18 (10.8)
Neutral	18 (16.4)	Neutral	30 (18.0)
Supportive	26 (23.6)	Supportive	31 (18.6)
Very supportive	42 (38.2)	Very supportive	56 (33.5)
Don't know	7 (6.4)	Don't know	11 (6.6)
N/A	3 (2.7)	N/A	4 (2.4)
From seniors		From juniors	
Very unsupportive	7 (6.4)	Very unsupportive	9 (5.4)
Unsupportive	7 (6.4)	Unsupportive	12 (7.3)
Neutral	21 (19.1)	Neutral	21 (12.7)
Supportive	32 (29.1)	Supportive	31 (18.8)
Very supportive	36 (32.7)	Very supportive	63 (38.2)
Don't know	6 (5.5)	Don't know	19 (11.5)
N/A	1 (0.9)	N/A	10 (6.1)
From fellow trainees			
Very unsupportive	5 (4.5)		
Unsupportive	4 (3.6)		
Neutral	16 (14.5)		
Supportive	23 (20.9)		
Very supportive	49 (44.5)		
Don't know	11 (10)		
N/A	2 (1.8)		

Values in parentheses are percentages. N/A, Not answered.

Table 5 Childcare arrangement and financial burden

Percentage of salary spent on childcare	Trainees (n = 349)	Consultants (n = 513)
0	13 (10.2)	17 (4.5)
1–5	9 (7.1)	36 (9.6)
6–10	23 (18.1)	65 (17.3)
11–20	28 (22.0)	86 (22.9)
21–30	23 (18.1)	76 (20.3)
31–50	22 (17.3)	55 (14.7)
>50	9 (7.1)	40 (10.7)

stated that they would be more likely to pursue surgery if part-time or flexible training were an option. However, this study revealed that most of them never had any formal surgical career advice and did not know if a flexible training policy were available in their desired workplace. Therefore, implementation of flexible and family-friendly workplace policies and providing more career advice are crucial to retaining and attracting talents to surgery.

One of the advantages of conducting this study through the internet was the wide dissemination of the survey, enabling it to reach an audience that would not be otherwise available through traditional channels. However, the trade-off was that there was no control over the denominator and therefore the response rate could not be calculated⁴³. This study was also limited by the lower-than-expected number of respondents as it was cut short due to COVID-19. This led to the need to combine several answer categories to perform binary comparisons. It also meant that

some geographical regions had insufficient number of respondents for meaningful statistical analysis and that statistical comparison could only be performed between Europe and Asia, the two regions with the greatest number of respondents. In addition, there were several potential sources of selection bias. For example, there was a clear geographical difference in response. A considerable proportion of responses from Turkey, Switzerland, Japan and Denmark, though invaluable as publications from these countries were relatively scarce, together with the low participation from USA and Canada would have combined to skew results. Moreover, there may also be selection bias within the students, as those who are more interested in surgery are likely to have responded to this survey. There were also more female respondents (61.5 per cent) than males overall, while the proportion of the female surgeons from the five countries with the most respondents was only around 7.6–32 per cent^{6,7,9,44,45}. Although in the questions where there was a statistically significant gender difference in the response, the female to male respondent ratio is around 50:50 (with female percentage ranging from 50.1 to 54.8 per cent), this was still a relative under-representation of men compared with the actual population structure of surgeons. Such a higher proportion of female respondents might be because females had stronger interest in this topic. This potentially introduced bias into the survey with men being under-represented.

In an era of increasing awareness of the benefits of gender diversity in the medical workforce, pregnancy-related gender and parenting inequality are still prevalent. This study revealed that a considerable proportion of surgeons had inadequate maternity/paternity leave. Gender disparity is also found to be more

important than geographical or career stage differences in the experience of parental leave and parenthood.

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Deidentified data will be available on request from the corresponding author via Google Doc.

Supplementary material

Supplementary material is available at *BJS* online.

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