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Factors affecting family planning among general surgery trainees

Caiwei Zheng^{1†}, Parker Bussies^{2,6*†}, Luccie Wo³, Sarah Eidelson⁴, Chi Zhang⁵, Joelle Mouhanna⁵ and Mecker G. Möller^{1,3*}

Abstract

Introduction Surgical trainees spend key years of their reproductive potential in training. However, their family planning needs are seldom addressed and remain poorly understood. This study was designed to understand the current landscape of family planning among General Surgery (GS) trainees and to identify the career-specific barriers they face.

Methods We created a 26-question survey to assess GS trainee experiences surrounding family planning. The survey was distributed to residency and fellowship program directors nationwide. Outcome measures were evaluated using Pearson's Chi-Square test and Fisher's exact test.

Results Two hundred thirty-four US GS surgical trainees completed the survey (male = 32.1%, female 66.2%, unreported = 1.7%). Work hours ($p=0.007$) and female gender ($p=0.002$) were associated with delayed childbirth. Time (93.2%), career/education goals (63%), and cost (59.5%) were most reported to prohibit childbearing. Females were significantly more impacted by time ($p=0.021$) and career/education goals ($p=0.001$) and more frequently considered fertility preservation ($p<0.001$).

Conclusion Time constraints and career goals are disproportionately more prohibitive to female surgeons when considering childbearing. Institutional resources should be tailored to gender-specific needs and address barriers to family planning.

Keywords Surgical training, General surgery, Family planning, Fertility preservation, Gender differences, Institutional support

[†]Caiwei Zheng and Parker Bussies contributed equally to this work.

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*Correspondence:

Parker Bussies

bussiep@ccf.org

Mecker G. Möller

mmoller@uchicago.edu

¹ Department of Surgery, University of Chicago Pritzker School of Medicine, 5841 S Maryland Ave, Chicago, IL 60637, USA

² Cleveland Clinic Foundation, Women's Health Institute, Cleveland, OH, USA

³ Department of Surgery, University of Miami Miller School of Medicine, Miami, FL, USA

⁴ Department of Surgery, University of Southern California, Los Angeles, CA, USA

⁵ University of Miami Miller School of Medicine, Miami, FL, USA

⁶ Department of Obstetrics and Gynecology, Cleveland Clinic Foundation, 9500 Euclid Ave, Cleveland, OH 44195, USA



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Background

Recent years have noted global trends in delayed child-bearing [1]. This has largely been attributed to increasing educational and professional opportunities for women, as well as improved access to effective birth control. According to the National Vital Statistics, the mean age at which women living in the United States (US) give birth to their first-born child has increased from 22.9 years in 2002 to 26.9 years in 2018 [2]. Similar trends have been observed among men [3]. As these numbers continue to rise, so do rates of age-related infertility and pregnancy complications [4, 5].

Physicians are particularly vulnerable to delayed child-bearing and age-related infertility. Recent data have identified a 5-year gap in maternal age at first birth between physicians (32 years) and nonphysicians (27 years), which confers a two-fold increased risk for age-related infertility [6]. This discrepancy is most prominent among physicians pursuing sub-specialty training, particularly within surgical fields [7, 8]. In one study of obstetrics and gynecology trainees, a staggering 71.8% endorsed postponing pregnancy due to residency [9]. Similar delays have been observed among orthopedic surgery residents [10]. As a result, surgical trainees risk experiencing significant regret upon completion of their training [6].

Evaluation of family planning goals among surgical trainees remains limited. Few studies (if any) have sought to understand the career-specific factors that influence them. This information is essential to optimizing their reproductive care and facilitating the achievement of both their personal and professional goals. In effort to address this problem, we performed a cross-sectional survey of General Surgery trainees in the United States to identify factors influencing family planning attitudes and behaviors.

Methods

We conducted a cross-sectional study surveying surgical trainees in the United States. The 26-question survey was internally piloted for functionality by a group of general surgery residents. The survey was administered by email through Qualtrics to 344 accredited categorical general surgery residency programs and 60 breast fellowship program coordinators across the US to be distributed to their trainees. Breast fellowship programs were selected for their unique characteristic of having relatively favorable work-life balance and female predominance, which we expected to represent those in the most favorable position for family planning amongst surgical trainees. A link to the Qualtrics survey was distributed to the targeted survey participants by the GS/breast fellowship programs. Participants were given two months to respond to this survey with two reminders sent. The

active data collection period was between May 2020 and July 2020. Respondents were entered into a raffle for a \$50 Amazon gift card as an incentive to participate. Responses were anonymous and participation was voluntary. A consent page was administered prior to survey initiation and implied consent was obtained for all participants, as approved by the University of Miami Institutional Review Board.

The survey was developed by a panel of surgical residents and faculty at the University of Miami and consists of a mix of short answer, Likert scales, yes/no questions, and ranking questions to collect data on trainee demographics and information regarding family planning goals and resources. Demographic information such as age, gender, level of training, sexual orientation, marital status, and history of medical problems were also collected. Factors thought to affect family planning were identified through literature review. These included: resident training year, career goals, prohibitive factors toward child-bearing, benefits surrounding family planning, plans to utilize oocyte cryopreservation, and institutional coverage of family planning services (see supplemental for full survey).

Data analysis was performed using IBM SPSS® 27.0.1.0. Responses marked as complete by Qualtrics, indicating participants viewed the survey in its entirety, were included. Those that were not marked as complete were excluded. Differences in participant responses were evaluated using Fisher's Exact testing. *P*-values less than 0.05 were considered statistically significant.

Results

There were a total of 283 responses to this survey in Qualtrics, 234 of which were complete and included in data analysis (82.7% completion rate). Trainees of all postgraduate levels (PGY1 – PGY7+) were represented, and collectively represented around 2.4% of the total general surgery trainees in the United States during this time period. Participant demographics are shown in Table 1. Seventy-five participants identified as male (32.6%) and 155 identified as female (67.4%), which over-represented the 44.8% female makeup of general surgery residents in 2020. Residents made up 73.5% ($n=169$) of included responses, with the remaining 26.5% ($n=61$) being fellows. The average respondent age was 32.2 years ($SD=3.18$). Most individuals were heterosexual (93.5%) and married (60.3%). Nearly half (44.9%) of respondents reported having children. Most residents planned to pursue a fellowship (82.2%), and 22.4% had considered fertility preservation. Female participants were more likely to be single or in an unmarried relationship ($p=0.014$) and were much more likely to have considered fertility preservation (29.8% vs 6.9%, $p<0.001$). More females (89.9%)

Table 1 Demographic characteristics of survey respondents

Characteristics	All Respondents n(%)	Female Respondents n(%)	Male Respondents n (%)	P-value (gender)
Total	234	155	75	
Position				0.751 ^a
Resident	169 (73.5)	115 (74.2)	54 (72.0)	
Fellow	61 (26.5)	40 (25.8)	21 (28.0)	
Age				0.269 ^a
26–30	66 (33.3)	45 (32.8)	21 (34.4)	
31–35	100 (50.5)	66 (48.2)	34 (55.7)	
36–40	32 (16.2)	26 (19.0)	6 (9.8)	
Sexual Orientation				0.213 ^a
Heterosexual	215 (93.5)	143 (92.3)	72 (96.0)	
Homosexual	7 (3.0)	4 (2.6)	3 (4.0)	
Bisexual	7 (3.0)	7 (4.5)	0 (0.0)	
Other	1 (0.4)	1 (0.6)	0 (0.0)	
Relationship Status				0.014 ^a
Single	37 (15.8)	27 (17.5)	10 (13.3)	
In a relationship (not married)	46 (19.7)	33 (21.4)	13 (17.3)	
Married	141 (60.3)	94 (61.0)	47 (62.7)	
Divorced/Separated	5 (2.1)	0 (0)	5 (6.7)	
Have Children	105 (44.9)	70 (45.2)	35 (46.7)	0.811 ^a
Indent to do Fellowship	139 (82.2)	98 (89.9)	41 (77.4)	0.052 ^a
Consider Fertility Preservation	50 (22.4)	45 (29.8)	5 (6.9)	<0.001 ^a

^a Fisher's-Exact Test

also reported planning to pursue fellowship training than did males (77.4%), however, this did not quite reach statistical significance ($p=0.052$).

In total, 101 trainees (22 male, 79 female) reported having delayed childbearing (Table 2). Work hours were found to be significantly associated with delay of childbearing, with trainees working over 80 h per week being significantly more likely to delay childbirth than those reporting less than 80-h workweeks ($p=0.007$). Childbearing delay was also associated with gender, as significantly more females (54.1%) endorsed current delays relative to their male counterparts (31.4%) ($p=0.002$). Though more female residents (89.9%) planned to pursue fellowship training than did male residents (77.4%) (Table 2), planning to pursue a fellowship itself was not associated with childbearing delays ($p>0.999$) (Table 3). This was true even with independent examination of females ($p=0.506$) Similarly, trainee age group (26–30, 31–35, 36–40) and relationship status did not significantly impact decisions to delay childbearing (both $p>0.05$).

In identifying perceived barriers to family planning, trainees were asked to report whether the following factors were prohibitive of having a child: cost, time, career and educational goals, lack of personal support (e.g. no

stable or supportive partner, family), lack of program support, prior medical condition, and age. Time was the most frequently reported prohibitive factor (93% of participants), followed by career goals (63% of participants) and cost (60% of participants). Though time and career/education goals were prohibitive to males and females, female trainees were more likely to rate these factors as prohibitive ($p=0.021$ and $p=0.001$, respectively) (Table 3). Cost, personal support, program support, pre-existing medical conditions, and age were similarly prohibitive to both genders (all $p>0.05$), although age trended towards being more of a factor for females than males.

Discussion

In this study, we found that a significant percentage of surgical trainees delay childbearing. An overwhelming majority of these individuals identified as female. Trainee work hours, career goals, and high cost were reported to significantly prohibit having children, whereas age, relationship status, and plans to complete a surgical fellowship did not. Importantly, lack of time and future career goals were seen as significantly more prohibitive by female participants than males. Female trainees were also more likely to have considered fertility preservation.

Table 2 Factors associated with delayed childbearing

Factors	Total Responses	Delays Childbearing					
		Total n(%) [‡]	P-Value (total)	Female n(%) [‡]	P-Value (female)	Male n(%) [‡]	P-Value (male)
Gender			0.002 ^a		n/a		n/a
Female	146	79 (54.1)		n/a		n/a	
Male	70	22 (31.4)		n/a		n/a	
Work Hours			0.007 ^a		0.053 ^a		0.160 ^a
< 60 h per week	19	4 (21.1)		3 (23.1)		1 (16.7)	
60–79 h per week	124	54 (43.5)		43 (49.4)		11 (23.4)	
80+ hours per week	73	43 (58.9)		33 (60.0)		10 (45.5)	
Intend to do Fellowship			> 0.999 ^a		0.506 ^a		> 0.999 ^a
Yes	131	62 (47.3)		50 (53.8)		12 (31.6)	
No	21	10 (47.6)		7 (70.0)		3 (27.3)	
Age Group			0.850 ^a		0.895 ^a		0.325 ^a
26–30	61	29 (47.5)		20 (48.8)		9 (45.0)	
31–35	94	40 (42.6)		32 (52.5)		8 (24.2)	
36–40	32	14 (43.8)		12 (46.2)		2 (33.3)	
Relationship Status			0.330 ^a		0.451 ^a		0.337 ^a
Single	34	15 (44.1)		12 (46.2)		3 (37.5)	
Married/In a Relationship	176	85 (48.3)		66 (55.5)		19 (33.3)	
Divorced/Separated	6	1 (16.7)		1 (100.0)		0 (0.0)	

[‡] Differences in sub-total population sample due to item non-response or missing^a Fisher's-Exact Test**Table 3** Perceived barriers to childbearing

Barriers	Total Responses	Not Prohibitive n(%)	Prohibitive n(%)	P-Value
Cost				0.202 ^a
Female	53	21 (39.6)	32 (60.4)	
Male	21	9 (42.9)	12 (57.1)	
Time				0.021 ^a
Female	53	1 (1.9)	52 (98.1)	
Male	21	4 (19.0)	17 (81.0)	
Career & Educational Goals				0.001 ^a
Female	53	3 (5.7)	50 (94.3)	
Male	21	8 (38.1)	13 (61.9)	
Lack of Personal Support				0.611 ^a
Female	53	26 (49.1)	27 (50.9)	
Male	21	12 (57.1)	9 (42.9)	
Lack of Program Support				0.441 ^a
Female	52	26 (50.0)	26 (50.0)	
Male	21	13 (54.2)	8 (45.8)	
Pre-Existing Medical Condition				0.196 ^a
Female	61	36 (59.0)	25 (41.0)	
Male	21	16 (76.2)	5 (23.8)	
Age				0.070 ^a
Female	52	27 (51.9)	25 (48.1)	
Male	21	16 (76.2)	5 (23.8)	

^a Fisher's-Exact Test

Physicians form a subpopulation of the workforce which is increasingly being recognized for its delays in childbearing [11]. As our study reinforces, such delays are highly attributed to their excessive work hours throughout specialty training. Trainees pursuing surgical careers experience significantly more demanding work hours than their non-surgical counterparts and are thus particularly vulnerable to childbearing delays [12]. This is compounded by longer program length, as it delays major salary advancement. Given fertility preservation approaches 15% of the average yearly resident salary (\$70,000) [13], it is not surprising our surgical trainees reported cost as a significant barrier to childbearing. Interestingly, we found that career goals significantly delayed childbearing, whereas the desire to pursue fellowship training did not. This distinction highlights additional career pressures beyond the scope of our survey, such as research productivity and academic performance, which are likely to serve as deterrents to having children while in training. Additional investigation is needed to elucidate these factors.

Our study also reveals key gender-specific disparities faced by female residents and fellows. Delayed childbearing and consideration of fertility preservation were significantly more common among females compared with males. The former was attributed to a disproportionately more negative impact of time shortage and career goals on females than males. Our findings corroborate those of Reid et al., who found female orthopedic surgery trainees were more likely than males to delay childbearing and to consider the negative impact of childbearing on their reputation and future career opportunities [10]. The reason for gender-specific effects of time and career goals on childbearing remains uncertain. One study of radiation oncology trainees found the partners of male residents were less likely to work and engaged in more child support when compared to the partners of female residents [11]. Therefore, we suspect female trainees with reduced partner support risk experiencing a more severe time shortage than their male colleagues, which may also impact their ability to pursue career goals. Improved access to hospital-affiliated or hospital-provided childcare could certainly help to reduce this disparity, though relatively few institutions offer these services to trainees [14–16]. Training program culture may also explain our observed gender differences. Recent study has revealed high percentages of Program Directors (PDs) who perceive childbearing as having a negative impact on female trainee work (61%) and a burden to their fellow residents (33%) [14]. This is in addition to their more negative perception of female trainees at baseline [17]. Given program leadership recommendation plays a significant role in the future

career success of trainees, their negative and potentially threatening sentiments regarding childbearing may preferentially dissuade females from childbearing. This corroborates a recent study within General Surgery, which found females to express significantly more concerns about future parental leave [18].

Improvements to program support and workplace culture carry significant potential in allowing surgical trainees to overcome the barriers to family planning identified through our survey. As our group previously reported, most programs do not provide surgical trainees with formal counseling regarding family planning/fertility treatments (12%) or fertility preservation (5.1%) [19]. Insurance coverage, provided by the training institutions, also seldomly covers fertility care [19]. Many Program Directors (PDs) are unaware of the fertility problems faced by their trainees [20], do not feel residency is a good time to have children, and feel having children negatively impacts trainee education [14]. As a result, surgical trainees do not feel supported in utilizing parental leave, and nearly half of trainees utilize less than two weeks of their allotted parental leave time [21]; very few (3.8%) even know the current American Board of Surgery parental leave policy. Surgical trainee programs must seek to empower their trainees, particularly females, through the normalization of childbearing among leadership and the education of their trainees surrounding institutional support.

There are a few limitations to consider with respect to our study. We depended on program directors/program coordinators to make the survey available to residents, making it difficult to know how much of the target population was actually reached. This led to a small sample size and may limit the generalizability of our findings to the larger surgical resident population. The nature of our ascertainment might also have introduced voluntary response bias, in that individuals willing to participate felt more strongly about improving family planning. This may be reflected by our overrepresentation of female trainees. Regarding gender, responses were limited to “male” and “female.” Improving inclusivity in future surveys may reveal additional subgroups that face unique barriers to family planning.

Conclusion

Time constraints, career goals, and cost serve as significant barriers to childbearing among physicians pursuing surgical training. Time constraints and career goals are more prohibitive to female surgeons. Additional study is needed to understand the extent and driving factors of these gender differences. Going forward, training institutions’ resources should be tailored to surgical training- and gender-specific needs when addressing barriers

to family planning. Focus should be placed on improving access to hospital-provided or hospital-affiliated child-care, educating trainees about available support services, and destigmatizing trainee childbearing among program leadership.

Supplementary Information

The online version contains supplementary material available at <https://doi.org/10.1186/s12909-024-06435-6>.

Supplementary Material 1.

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Authors' contributions

L.W. conceived and helped design the study, aided in acquisition of data, and revised the manuscript. S.E. helped design the study and revised the manuscript. M.M. also helped conceive the study and design, oversaw the conducting of the project, and revised the manuscript. C.Zheng helped design the project, performed statistical analysis, and helped draft the manuscript. J.M. helped acquire the data. C.Zhang oversaw the statistical analysis and revised the manuscript. P.B. acquired the data, performed statistical analysis, and wrote the manuscript.

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Data availability

Results of statistical analysis are provided within the manuscript. Please email Dr. Parker Bussies (bussiesp@ccf.org) for any inquiries of the raw data.

Declarations

Ethics approval and consent to participate

All methods were performed in accordance with the Declaration of Helsinki. A consent page was administered prior to survey initiation and implied consent was obtained for all participants, as approved by the University of Miami IRB (Reference #20200476).

Consent for publication

All authors give consent to publish this manuscript.

Competing interests

The authors declare no competing interests.

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