

Childbearing and Pregnancy Trends Among Female Plastic and Orthopedic/Trauma Surgeons in German-speaking Countries

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Background: Female surgeons face challenges when trying to balance family planning and surgical duties. Although US surgeons have been thoroughly investigated in terms of obstetric complications and perception toward pregnancy, information on surgeons in German-speaking countries is lacking.

Methods: A multicentric online survey was conducted to analyze female plastic and orthopedic/trauma surgeons from Germany, and plastic surgeons from Switzerland and Austria.

Results: Mean age during first pregnancy was 33 years. More than one-third of all surgeons intentionally postponed pregnancy for professional reasons. About one-third of the German surgeons was banned from clinical work during pregnancy, whereas 6% of all Swiss/Austrian surgeons were banned. Accordingly, the Swiss/Austrian surgeons were operating more often during pregnancy. Obstetric complications ranged from 41% to 58%. The Swiss/Austrian plastic surgeons had the lowest complication rate. The rate of cervical insufficiency was approximately 4%, which was higher than in the general and US surgeons' population, whereas fertility issues and miscarriage were lower in German-speaking plastic surgeons.

Conclusions: Despite national maternity protection laws, obstetric complication rates of surgeons in German-speaking countries and the United States were similar. Cervical insufficiency was even more prevalent in the study population, which could be associated with an older age of the expectants. Therefore, those (strict) laws need to be reconsidered because a ban from surgery can lead to intentional postponement of pregnancy. (*Plast Reconstr Surg Glob Open* 2025;13:e6628; doi: [10.1097/GOX.00000000000006628](https://doi.org/10.1097/GOX.00000000000006628); Published online 20 March 2025.)

INTRODUCTION

The number of female physicians has increased worldwide. However, the gender gap in surgical specialties narrows comparatively slowly.^{1,2} According to a

statistical report of the German Medical Association, the percentage of female surgeons was only 22% in 2020,³ leaving women still underrepresented in surgical specialties,¹ with only 5% of all heads of surgical departments being female.⁴ Consequently, the proportion of women in surgical specialties needs to increase to cope with needed staff resources in a world of surgeon shortage. However, there are still obstacles that discourage women from pursuing a career in surgery. Women in surgery often struggle with balancing work and private life, and fear stigmatization by colleagues.² Surgical training, as shown in the United States, may lead to delay of pregnancy and motherhood, resulting in infertility due to advanced maternal age.⁵

In the European Union, a specific directive governs work during pregnancy.⁶ This directive not only sets

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minimum standards for maternity and parental leave but also mandates the protection of pregnant workers from hazardous work environments. Although the directive provides a broad framework, each member state interprets and enforces it through additional national legislation. For instance, regarding radiation exposure, most nations set a maximum dose to 1 mSv for the unborn child. But some countries, including Austria, Italy, and Poland, go further by completely exempting pregnant workers from radiation-related tasks.^{7,8}

There are strict professional regulations in Germany regarding pregnant employees, which caused many surgeons to be banned from working in the operating theater. In 2018, the German Maternity Protection Act was amended to ensure equal opportunities at work while also protecting pregnant women and their unborn children (*Mutterschutzgesetz* [MuSchG]). Nevertheless, this amendment is applied inconsistently nationwide, and some women are still immediately banned from all surgical activities the moment pregnancy is announced. These restrictions often cause a delay of residency. This might lead to postponement of pregnancy until career goals are achieved.⁹

The impact of those restrictions should be evaluated in terms of obstetric complications and the compatibility of pregnancy and motherhood with professional activities. We therefore performed a study to characterize the perception of female plastic surgeons toward pregnancy, childbearing, and experiences with work-related burdens in Germany. To rule out specialty-specific influence, results were compared with German orthopedic and trauma surgeons. The German questionnaire was also sent to Switzerland and Austria to detect some potential country-specific differences. As such, we present the findings of an international survey involving German-speaking countries.

METHODS

A self-administered 48-item survey was sent to female plastic surgeons, including residents training in plastic surgery in Germany, Austria, and Switzerland, as well as female orthopedic and trauma surgeons in Germany. The survey was created via SoSci Survey (Leiner, 2019, version 3.1.06, www.sosicisurvey.de) and distributed electronically through e-mail via the respective societies, which forwarded the e-mail to 710 German plastic, 99 Austrian plastic, 56 Swiss plastic, and 1555 German orthopedic/trauma female surgeons. The survey was distributed in 2023 and was available for 4 weeks. One week before the end of the survey, a reminder e-mail was sent to each participant. Participation was voluntary and responses were anonymous.

Survey Instrument

The survey included basic demographic questions, pregnancy history including complications, desire to have children, opinions toward burdens of having children as a plastic or orthopedic/trauma surgeon, and fertility issues.

Attitudes toward pregnancy and motherhood were assessed using a 5-point Likert scale from “fully agree” (5 points) to “do not agree at all” (1 point). For each

Takeaways

Question: To analyze perception toward pregnancy and obstetric risks factors of German-speaking female (plastic) surgeons.

Findings: Obstetric complications do not substantially differ from US surgeons despite stricter maternity protection laws. Older age during the first pregnancy seems to be the main issue in this professional group.

Meaning: Overly strict rules leading to a ban from the operating room during pregnancy need to be reconsidered and the attitude toward pregnancy, and motherhood needs to be changed to conquer fear of discrimination and bias.

pregnancy, the participant was requested to provide information about the amount of certain professional activities she performed, as well as whether she was banned from surgery or work.

Statistical Analysis

Data are indicated as mean \pm SD or percentage. Given the small sample size of Austrian and Swiss plastic surgeons, those participants were combined as 1 group (non-German plastic surgeons). Statistical analysis was performed with GraphPad Prism 9.5.1 (San Diego, CA). To analyze attitudes toward pregnancy and motherhood, the Mann-Whitney test was used to compare mothers with childless surgeons within the same group, whereas the Kruskal-Wallis test with Dunn’s correction for multiple comparison was applied to evaluate differences between groups (German plastic surgeons versus Swiss/Austrian plastic surgeons versus German orthopedic/trauma surgeons). The Fisher exact test was used to determine associations between professional activities during pregnancy and major obstetric complications. A *P* of less than 0.05 was considered significant.

RESULTS

Demographics

Overall response rate was 21.5%. Of the 710 German plastic surgeons, 177 completed the survey (response rate 25%), whereas 10 of the 99 Austrian women (18% response rate) and 15 of the 56 Swiss women (27% response rate) took part in the study. Of the 1555 orthopedic/trauma surgeons, 250 completed the survey (response rate 16%). Table 1 shows demographic data, professional position, and parental status of the participants.

Professional Reasons for Intentional Postponement of Pregnancy

Forty-four percent of German plastic surgeons, 36% of Austrian/Swiss plastic surgeons, and 31.6% of orthopedic/trauma surgeons with a desire to have children (also in the past) postponed pregnancy for career reasons (Fig. 1).

Eighty-six German plastic surgeons reported a current desire to have children. Of those, 55 (64.7%) women were 32 years of age or older. Forty-one (74.5%) women of this

Table 1. Participants' Demographics

| | German Plastic Surgeons (n = 177) | Swiss/Austrian Plastic Surgeons (n = 25) | German Orthopedic/ Trauma Surgeons (n = 250) |
|------------------------------------------|--------------------------------------|---------------------------------------------|-------------------------------------------------|
| Age, y | 39.01 ± 8.82 | 39.24 ± 9.58 | 39.5 ± 7.42 |
| - Mothers | 41.6 ± 9.68 | 42.6 ± 10 | 40.68 ± 6.87 |
| - Childless | 34.13 ± 6.38 | 32.13 ± 4.4 | 37.35 ± 7.95 |
| Professional position, n (%) | | | |
| - Resident | 51 (28.81) | 7 (28) | 68 (27.20) |
| - Specialist | 38 (21.47) | 1 (4) | 70 (28) |
| - Senior physician | 53 (29.94) | 11 (44) | 91 (36.40) |
| - Chief/head of department | 7 (3.95) | 0 (0) | 7 (2.80) |
| - Leading own practice | 28 (15.82) | 6 (24) | 14 (5.60) |
| Employment position, n (%) | | | |
| - Maximum care hospital | 73 (41.24) | 14 (56) | 106 (42.40) |
| - Municipal hospital | 44 (24.86) | 2 (8) | 106 (42.40) |
| - Practice | 54 (30.51) | 9 (36) | 25 (10) |
| - Ambulatory healthcare center | 4 (2.26) | 0 (0) | 5 (2) |
| Parental status, n (%) | | | |
| - Mothers | 114 (64.4) | 17 (68) | 160 (64) |
| - Childless | 63 (35.6) | 8 (32) | 90 (36) |
| No. children (mean) | 1.68 | 1.94 | 1.71 |
| - 1 | 52 (45.61) | 2 (11.8) | 67 (41.88) |
| - 2 | 48 (42.11) | 9 (52.9) | 75 (46.88) |
| - 3 | 10 (8.77) | 4 (23.5) | 15 (9.38) |
| - 4+ | 4 (3.51) | 0 (0) | 3 (1.88) |
| Age during first pregnancy, y | 33.06 ± 8.52 | 32.94 ± 2 | 32.93 ± 4.20 |
| Profession during first pregnancy, n (%) | | | |
| - Student | 3 (2.63) | 0 (0) | 9 (5.63) |
| - Resident | 50 (43.86) | 8 (47) | 90 (56.25) |
| First year | 2 (1.75) | 0 (0) | 2 (2.2) |
| Second year | 3 (2.63) | 0 (0) | 8 (8.9) |
| Third year | 7 (6.14) | 2 (25) | 21 (23.3) |
| Fourth year | 12 (10.53) | 2 (25) | 23 (25.56) |
| Fifth year | 9 (7.89) | 1 (12.5) | 15 (16.7) |
| Sixth year | 15 (13.16) | 2 (25) | 15 (16.7) |
| >Sixth year | 35 (30.70) | 1 (12.5) | 8 (8.9) |
| - Specialist | 25 (21.93) | 4 (23.5%) | 49 (30.63) |
| - Senior physician | 31 (27.19) | 5 (29.4) | 58 (36.25) |
| - Chief/head of department | 1 (0.88) | 0 (0) | 4 (2.5) |
| - Leading own practice | 4 (3.51) | 0 (0) | 14 (8.75) |

group were still delaying pregnancy (21.8% until finishing training and 25.5% until getting into a higher position as attending or switching to outpatient practice or getting a permanent contract).

Of the 11 Austrian/Swiss plastic surgeons with a current desire to have children, 7 (63.6%) were 32 years of age or older. Two (28.6%) of those were childless and were still delaying pregnancy.

Of the 95 orthopedic/trauma surgeons with a desire to have children, 67 were 32 years of age or older. Of those, 47 (70.2%) women stated to be delaying pregnancy (38.8% until finishing specialty training, 7.5% until working in a practice, and 11.9% until getting a permanent contract).

Perception Toward Pregnancy/Motherhood and Their Compatibility With Surgical Profession

All participants were asked to agree or disagree with various statements concerning the compatibility of their surgical profession and the desire to have children (Fig. 2). In all 3 groups, childless women believed that

their professional responsibilities limit the abilities of being a mother. Reputational concerns among peers and superiors were highest amongst the childless German plastic surgeons. They also had more fear of having less chance to get promoted to leadership positions compared with the mothers in that field.

Professional Restrictions During Pregnancy

About one-third of all pregnancies resulted in a ban from practicing surgery in Germany. Approximately half of those bans were due to the COVID-19 pandemic (Fig. 3). The other half was for medical reasons, stress, or other reasons like bureaucratic ones ("restructuring of the workplace too complicated"). Twenty-five percent of plastic and 35% of orthopedic/trauma surgeons banned from work received no sufficient individual risk assessment when pregnancy was announced.

In the surveyed population of Swiss/Austrian plastic surgeon mothers, 1 (6%) person, who was pregnant after 2020 (marking the beginning of the COVID-19 pandemic),

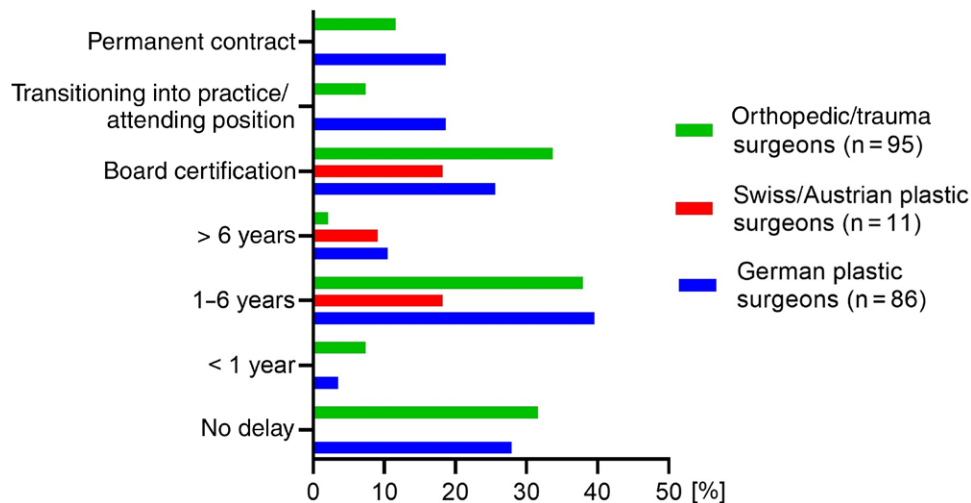


Fig. 1. Reasons for/duration of postponing pregnancy. A period of 1–6 years of postponement was indicated most often. The most common reason for postponing pregnancy was getting board certification as a specialist.

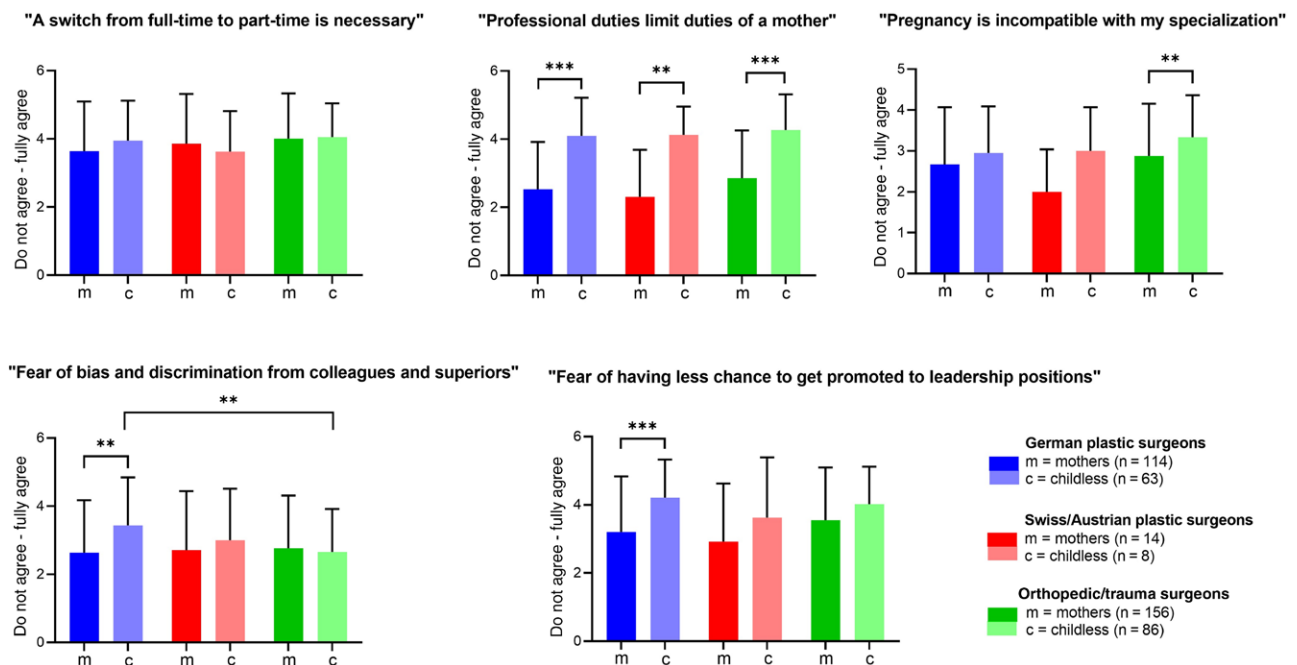


Fig. 2. Attitude toward pregnancy and motherhood and their compatibility with the surgeons' profession. Likert scale: 1 = do not agree at all, 2 = rather not agree, 3 = neither, 4 = rather agree, 5 = fully agree. Comparisons between mothers and childless women within each group were performed via Mann-Whitney test. Multiple comparisons between different groups were performed via Kruskal–Wallis test with Dunn's multiple comparison. $**P < 0.01$. $***P < 0.001$.

was banned from clinical work as soon as pregnancy was announced (Fig. 3). Thirteen (42%) expectant mothers felt that they were insufficiently educated. Nine (69%) of those stated that there had been no discussion/risk assessment with the employer.

Surgical Activities During Pregnancy

Of all German plastic surgeons, the majority (41.24%) were doing surgical activities for 11–20 hours/wk, whereas 16.95% were spending more than 20 hours in the

operating room. Only 2.82% reported not doing any surgical activities. During pregnancy (n = 114), the rate of those doing surgical activities for 11–20 hours/wk was only 22.8% (Fig. 4).

The majority of the Swiss/Austrian plastic surgeons operated between 11 and 20 hours/wk (15 = 60%), whereas 4 (16%) answered to be spending more than 20 hours/wk operating. During pregnancy, the majority (13 = 48%) operated 11–20 hours/wk, which was the highest rate among all 3 surgical groups (Fig. 4).

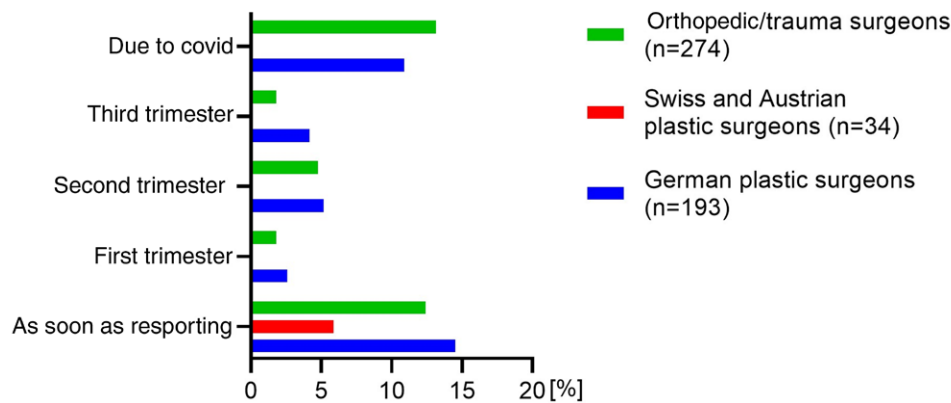


Fig. 3. Professional ban during pregnancy.

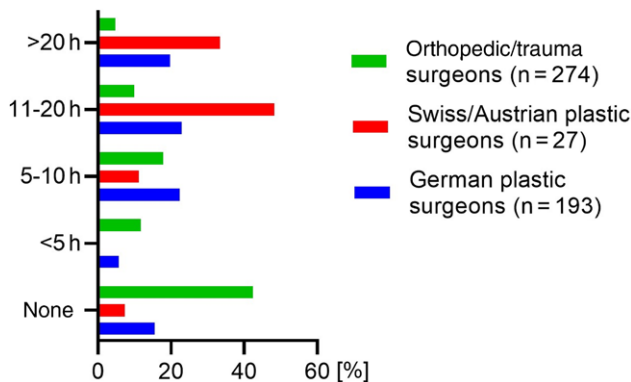


Fig. 4. Surgical activity during pregnancy.

In the group of the orthopedic/trauma surgeons, the majority (37.2%) were operating 5–10 hours/wk, whereas 10.8% were not doing surgical activities. During pregnancy, the amount of women not doing any surgery rose to 42.34%, whereas 17.88% were operating 11–20 hours/wk (Fig. 4).

Obstetric Complications and Fertility Issues

Table 2 shows the study population's rate of obstetric complications and reproductive issues. The rates were compared with the German general population,^{11–13,15–20} and a US plastic surgeon¹⁰ and US orthopedic/trauma surgeon population.¹⁴ Fertility issues, including an unfulfilled desire to have children and miscarriage rate, were more prevalent in the US surgeon's cohort. Cervical insufficiency was higher in the present study's population compared with the German general and US surgeon's cohort.

In vitro fertilization (IVF) was the most common assisted reproductive technology, which 12 of the German plastic surgeons made use of (Fig. 5). Of the Swiss/Austrian population, there was 1 woman who tried IVF without success and had multiple miscarriages. There were 13 German orthopedic/trauma surgeons who used IVF, of whom 5 were childless.

Pregnancies were categorized into “no complications,” “complications,” and “major complications” (including preeclampsia and cervical insufficiency). For each

category, the amount of certain professional activities was indicated as “hours per week.” (See figure, **Supplemental Digital Content 1**, which displays professional activities during pregnancy of [A] German plastic surgeons: – no complications [n = 82], + complications [n = 110], ++ major complications [n = 14]; [B] Swiss/Austrian Plastic Surgeons: – no complications [n = 12], + complications [n = 15], ++ major complications [n = 2]; [C] German orthopedic/trauma surgeons: – no complications [n = 114], + complications [n = 160], ++ major complications [n = 12]. The amount of activities was indicated as hours per week, <http://links.lww.com/PRSGO/D923>.) A potential association between the amount of certain activities and the occurrence of major complications was calculated (Table 3). No association was found except for the amount of night shifts in the group of German plastic surgeons ($P = 0.006$). Unexpectedly, more night shifts were associated with fewer major complications (Table 3).

DISCUSSION

This study shows that pregnancy and motherhood are still viewed as a burden for a surgical career by women, especially by those without children. In accordance with prior studies, a high proportion of surgeons postponed pregnancy due to career reasons,^{21,22} potentially causing reproductive issues of the affected female surgeons. Higher infertility rates (more than 30%) and pregnancy loss rates (of 42%) were reported among US female surgeons compared with the general US female population, which correlated with older age and higher stage of education.^{23,24} Female surgeons were more likely to delay pregnancy until after surgical training and to have major obstetric complications.²³ In the current study, the rate of fertility issues and miscarriage was lower for plastic surgeons compared with orthopedic/trauma surgeons, but was still lower for both groups compared with US surgeons.^{11,13} This might be explained by higher physical demands and known lack of consistent maternity leave policies and institutional support for pregnancy in the United States.⁷ In the United States, both orthopedic and plastic surgeons are known to be at higher risk for obstetric complications, infertility, and miscarriage compared with the general US population.^{5,17} Similarly, in our

Table 2. Obstetric Complication and Fertility Issue Rate per Pregnancy or Woman in Comparison to the German General Population and the US Plastic Surgeons as Reviewed From Hemal et al¹⁰

| | German Plastic Surgeons (n = 173), %* | Swiss/Austrian Plastic Surgeons (n = 24), %* | German Orthopedic/Trauma Surgeons (n = 242), %*† | General Population (Germany), % | US Plastic Surgeons, % ⁹ | US Orthopedic/Trauma Surgeons, % |
|------------------------------------------------------------|---------------------------------------|----------------------------------------------|--------------------------------------------------|-----------------------------------------|-------------------------------------|----------------------------------|
| Fertility issues/use of assisted reproductive technologies | 10.4 | 4.2 | 31.4 | 11.4% ¹¹ | 29 | 32 ¹² |
| Infertility/unfulfilled desire to have children | 4 | 4.2 | 12 | 30 (35–44 y) ¹³ | 50 | 17–30.4 ¹⁴ |
| (Elective) abortion | None | None | 1.23 | 0.5 ¹⁵ | 16 | 2.7 ⁵ |
| (Multiple) miscarriages | 6.4 | 4.2 | 16.1 | 12 ¹² | 44 | 38 ¹⁴ |
| Ectopic pregnancy | 6.4 | None | 17.8 | 1.3–2.4 ¹⁶ | n/a | n/a |
| All pregnancies | German plastic surgeons (n = 193) | Swiss/Austrian plastic surgeons (n = 34) | German orthopedic/trauma surgeons (n = 274) | General Population (Germany) | US plastic surgeons ^{17,†} | US orthopedic/trauma surgeons |
| Obstetric | | | | | | |
| Complications (overall) | 57 | 46 | 58.4 | 44 | 47.1 | 24.2–31.2 ¹⁴ |
| Hyperemesis gravidarum | 23.8 | 15 | 18.6 | 28 ¹⁷ | 16.7 ^{20,‡} | n/a |
| Leg edema | 39.5 | 41 | 33.2 | 0.22 (moderate to severe) ¹⁷ | n/a | n/a |
| Pain | 21.8 | 12 | 20.8 | 30 ¹⁸ | n/a | n/a |
| Preterm labor | 14 | 12 | 14.2 | 1 ¹⁷ | 14 | 3.9–8.6 ¹⁴ |
| Ordered bed rest due to complications | 8.8 | 9 | 6.2 | n/a | 18 | n/a |
| Bleeding | 9.3 | 9 | 15.7 | 1.3 ¹⁷ | 1.5 ^{20,‡} | 1.87 ^{5,§} |
| Preeclampsia/HELLP syndrome | 3.1 | 3 | 0.7 | 2 ¹⁹ | 5.8 | 6.4–11.7 ¹⁴ |
| Cervical insufficiency | 4.1 | 3 | 3.7 | 1 | 1.5 ^{20,‡} | 1.6 ^{5,§} |
| Gestational diabetes | 4.1 | 3 | 4.4 | 9.4 ¹⁷ | 2.6 | 1.6–4 ¹⁴ |

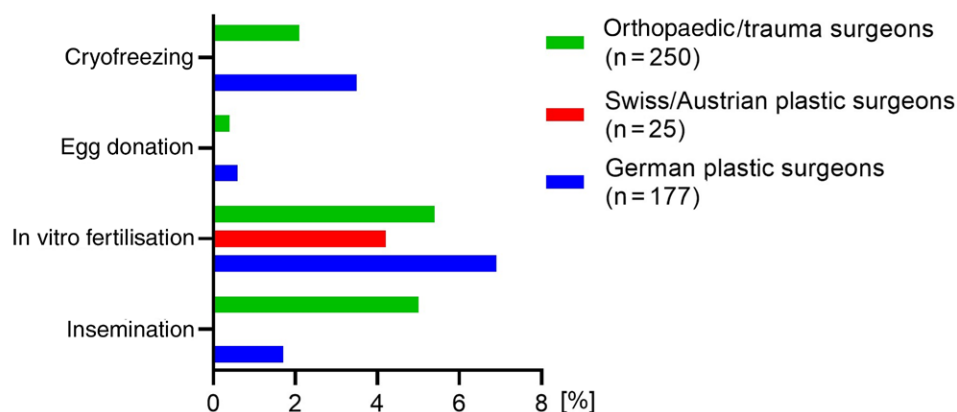
*Four German plastic surgeons, 1 Swiss/Austrian plastic surgeon, and 8 orthopedic/trauma surgeons indicated that they experienced fertility issues but were not willing to answer questions about the topic.

†Three women of the orthopedic/trauma surgeons were excluded due to preexisting medical conditions, including endometriosis and thrombophilia.

‡Complication rates were reported per pregnant women.

§Mean of all pregnancies as the first, second, and third pregnancies were separately analyzed.

HELLP, hemolysis, elevated liver enzymes, low platelet levels; n/a, not available.

**Fig. 5.** Use of assisted reproductive methods.

study population, the rates of obstetric complication were higher compared with the general German population, except for hyperemesis gravidarum, pain, preeclampsia, gestational diabetes, and infertility.

The German Maternity Protection Act serves to protect the health of pregnant women and the unborn child by implementing strict rules that might lead to exclusion from the operating room the moment pregnancy is announced. Walsh et al²⁵ studied maternity policies in

different countries and their potential impact on complications and surgical activities. They found that Germany has rather strict protection rules for the pregnant and the unborn compared with the United States or China.²⁵ Despite those national restrictions, obstetric complication rates were not substantially lower in our study population than in US populations analyzed elsewhere.^{5,11,13} Overall complications were even higher in the German surgeon groups, most likely because we included leg edema, which

Table 3. Association Between Frequency of Professional Activities During Pregnancies and Prevalence of Major Pregnancy Complications

| Activity | Complications during pregnancy | German Plastic Surgeons | | | Swiss/Austrian Plastic Surgeons | | | German Orthopedic/Trauma Surgeons | | |
|--------------------------|--------------------------------|-------------------------|-----------|-----------------------|---------------------------------|-----------|-----------------------|-----------------------------------|-----------|-----------------------|
| | | <5 h/wk | 5–20 h/wk | P (Fisher exact test) | <5 h/wk | 5–20 h/wk | P (Fisher exact test) | <5 h/wk | 5–20 h/wk | P (Fisher exact test) |
| Surgery | None | 15 | 57 | 0.15 | 2 | 12 | >0.99 | 58 | 37 | 0.75 |
| | Major | 5 | 7 | | 0 | 2 | | 6 | 5 | |
| Standing | None | 14 | 58 | 0.7 | 0 | 12 | >0.99 | 28 | 98 | >0.99 |
| | Major | 3 | 9 | | 0 | 2 | | 1 | 7 | |
| Seating | None | 6 | 65 | 0.33 | 0 | 12 | >0.99 | 22 | 64 | 0.065 |
| | Major | 2 | 10 | | 0 | 2 | | 0 | 11 | |
| Administrative | None | 12 | 58 | 0.69 | 2 | 10 | 0.40 | 24 | 74 | 0.12 |
| | Major | 3 | 9 | | 1 | 1 | | 0 | 11 | |
| Consultation/ward rounds | None | 6 | 65 | 0.12 | 0 | 12 | 0.14 | 27 | 69 | 0.11 |
| | Major | 3 | 9 | | 1 | 1 | | 0 | 9 | |
| X-ray | None | 63 | 6 | 0.59 | 11 | 1 | >0.99 | 82 | 13 | 0.35 |
| | Major | 11 | 0 | | 2 | 0 | | 11 | 0 | |
| Night shifts | None | 52 | 37 | 0.006 | 7 | 5 | >0.99 | 79 | 18 | 0.23 |
| | Major | 11 | 0 | | 1 | 1 | | 7 | 4 | |

is a common symptom of pregnant women²⁶ and even in nonpregnant surgeons. Cervical insufficiency as a major complication tended to be higher in our study population compared with the US population and the general population in Germany. This could be partially associated with the older age of the mothers giving birth to their first child in our population (33 versus 30 y in the German population²⁷ and in the US plastic surgeon population²⁷) because there is a known accumulation associated with older age.²⁸

Reproductive risk factors for female surgeons can be divided into direct and indirect ones according to Schizas et al.¹ Direct factors include physical factors (extensive standing, sharp injuries, radiation) and organizational hazards (long working hours, night shifts), whereas indirect factors relate to work-life-imbalance conflicts where women are challenged with integrating pregnancy and motherhood with their surgical training and academic career.¹ Direct factors play a minor role in Germany due to the MuschG. Presumably well intentioned, harsh restrictions may be viewed negatively by pregnant surgeons.²⁹ A ban from the operating theater may lead to delayed pregnancy reporting so that the affected women do not fall behind in their surgical skills.²⁹ The MuschG amendment of 2018 was supposed to grant pregnant women more rights in terms of being able to restructure the workplace before being completely banned from it. For instance, the pregnant surgeon should not undergo more than 4 hours of standing activities after the fifth month of pregnancy. Some specialties, for example, cardiac surgery have recommended to implement those restrictions into the surgical routine, creating a specialty-specific catalog of surgical activities that are allowed during the stages of pregnancy.³⁰

We did not find an association between surgical activities and major complications. Although the Swiss and Austrian plastic surgeons operated more hours per week than the German surgeons, complications were comparable among all groups. The rate of fertility issues, miscarriages, and ectopic pregnancies was even lower in the

group of Swiss/Austrian surgeons. Interestingly, more night shifts were associated with fewer major complications. This might arise from the fact that those with high-risk pregnancies with major complications were banned from night shifts in the first place.

In the current survey, residents represented the largest group. Most participants delayed pregnancy until finishing training. However, there was a remarkable number of women (two-thirds of the German surgeons ≥ 32 y) who intentionally postponed their pregnancy until having pursued certain career goals. A prior study on female orthopedic surgeons revealed that family affected the female surgeon's career, with 15% feeling that having children had markedly slowed their career.⁵ This attitude is also reflected in our study. Childless women were more likely to believe that motherhood is not compatible with their profession. Particularly, the childless German plastic surgeons had more reputational and career concerns. A ban from surgery contributes to a lack of surgical exposure and a regression in practical skills compared with nonpregnant (male) colleagues.

This study is limited to the survey design. The used survey was not validated and the response rate was rather low, despite that various methods to secure a satisfactory response rate were applied.³¹ Nevertheless, our response rate of approximately 20% is in accordance with a prior survey of US plastic surgeons,¹⁷ but this does not exclude a voluntary response bias. The Swiss/Austrian plastic surgeon group was rather small so that pairwise comparisons between different groups were not always possible. The complication rates of US surgeons are based on reviewed data in the literature. Thus, a direct comparison of the rates has to be done with caution because reported complications were not always the same and rates were defined differently (per pregnancy versus per pregnant woman). Nevertheless, the trends captured in this study, which is a higher rate of obstetric complications of the surgeons compared with the general population, are similar to those reported in other studies.^{5,17,25}

The similar complication rates throughout all groups including the US population and even the higher rate of cervical insufficiency in our study population suggest that neither national laws leading to a ban from surgery nor surgical specialty have an exclusive influence on the unborn's and expectant's well-being, albeit the rates of fertility issues and miscarriage differed in favor of the German-speaking plastic surgeons. In fact, the above-mentioned indirect factors including work-life-imbalance conflicts seem to be substantial as well.¹ The expectant's age is important in particular when it comes to the course of pregnancy. Therefore, too strict rules as implemented in (certain parts of) Germany with complete ban from the operating theater during pregnancy might lead to procrastination of pregnancy with fertility issues and higher complication rates as a consequence. The introduction of a standardized assessment of clinician work, including an operation catalog, which considers the pregnancy week and outlines the necessary settings (similar to that described earlier³⁰), including providing a colleague who could take over a surgery if needed, could lead to a safe and inclusive work environment for pregnant surgeons without them fearing loss of training and, as a consequence, intentionally postponing pregnancy. Additionally, the risk assessment should be conducted with the primary goal to find work modifications with preventive measures such as providing a chair while operating or mandatory hepatitis C and HIV screenings for patients before surgery, allowing the surgeon to continue her work within safe conditions. Employers and training institutions should proactively consider potential family planning and the possibility of pregnancy-related absences from the start. This includes education of female employees concerning pregnancy and its potential impact on training and professional activities from the beginning of their employment as a first step of changing attitudes toward pregnancy and motherhood as well as raising awareness of infertility risks in case of intentionally postponing pregnancy.⁹ A mentorship program to connect mothers with a similar career path with childless women who pursue pregnancy in the (near) future can also be a rationale to take away certain fears. Such measures are crucial not only for promoting gender equality but to work toward eliminating the stigma surrounding pregnancy in surgery and enhancing the possibility for women to have a surgical career.

In conclusion, the study shows that German-speaking surgeons experience similar barriers in family planning compared with US surgeons which is mainly ascribed to an older age during the first pregnancy due to intentional postponement for career reasons. The above-mentioned recommendations that can be implemented internationally could aid in overcoming the obstacles of gender gap in the surgical specialties, which is essential given the current gender distribution among medical students.

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DISCLOSURES

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ETHICAL APPROVAL

The institutional ethics committee confirmed that no ethical approval was necessary for conducting the study (inquiry number: 22-374-ANF).

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