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# Family planning and parity among pediatric surgeons — it is time to confront a serious problem (a survey among Brazilian female pediatric surgeons)

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## Abstract

**Background:** Obstetric problems and infertility affect female surgeons. Family perspectives influence specialty choice and attrition rates. We aim to study parity, fertility, and family planning among female pediatric surgeons. A questionnaire was filled out by licensed BFPS to evaluate pregnancy/motherhood among Brazilian female pediatric surgeons (BFPS). The professionals were divided into two groups that were compared (< 40 and ≥ 40 years of age).

**Results:** Eighty-three < 40 and 91 ≥ 40-year-old BFPS were included, of which 2/3 were mothers. Most planned children after being hired as consultants. Almost a tenth (8.87%) reported marital conflicts secondary to the refusal to get pregnant. A fifth reported a high-risk pregnancy, and 12.73% had miscarriages. Half reported no adverse consequences of postponing pregnancy, but 6.9% stayed childless, 16.67% had fewer children than planned, and 10.92% needed infertility treatment. Professional problems related to pregnancy/motherhood were reported by 59.09%, and 86.36% of the women who were mothers had difficulties conciliating professional duties and motherhood.

**Conclusion:** BFPS parity was 1.38, lower than Brazilian women (mean 1.77 children/woman). Most BFPS start their families by late 30s or early 40s. Unfavorable consequences of postponing pregnancy affected a third of BFPS. Time off after pregnancy and protection during pregnancy remain problematic. A hostile environment and life-career conflicts may lead to the abandonment of the specialty.

**Keywords:** Pregnancy, Job market, Fertility, Pediatric surgeon, Gender policy

## Background

Late gestations, obstetric problems, and infertility are important problems among female physicians, especially among specialized surgeons, due to the long formative period, exposure to volatile anesthetic agents, and other environmental risks [1]. Hostile attitudes toward females/pregnancy are still present, partially due to the traditional

predominance of male surgeons and the relative rarity of females in high administrative and leadership roles or as mentors for young surgeons [2].

Practical problems involving working scales, child-care logistics, including support for lactation, and back-up schemes to take care of unplanned problems, besides the cost of maternity leave, are important. Also, moral problems should be considered. A surgeon's aspirations and commitments as a citizen and a human being are no less important than his/her attainments and engagements as a professional and influence his/her performance as a physician.

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Family priorities and motherhood perspectives influence specialty selection and are known to limit the proportion of female surgeons, their professional success, attrition rates during the fellowship, and long-term persistence in surgical specialties.

The minimum requirements to be certified as a pediatric surgeon in Brazil require 12 years of training (6 years of medical school/internship, 3 years of general surgery, and 3 years of pediatric surgery). As the mean age for admission into medical school in Brazil is 20.3 years old [3], most Brazilian female pediatric surgeons (BFPS) are  $\geq 30$  years old at the end of their obligatory training. Brazilian laws for maternity leave (federal law 11770-9) allow for 6 months of maternity leave [4], but this does not apply to self-employed professionals, which are common among Brazilian physicians.

Difficulties in getting pregnant, need for infertility treatment, obstetric problems, and being childless are frequently reported among BFPS and reaffirmed in social media groups of Brazilian physicians. We felt the need to quantify the problem, in order to be able to design solutions to better support young professionals' needs. This research aims to present an evaluation of the situation of BFPS in what concerns pregnancy and motherhood, including personal evaluations concerning professional barriers and difficulties to family life.

## Materials and methods

### This paper is designed as a survey

A non-validated questionnaire was sent to the female members of the Brazilian Association of Pediatric Surgeons (CIPE), a national entity congregating most Brazilian pediatric surgeons, as a Google Forms questionnaire. The questionnaire was elaborated after extensive discussion in a group composed of BFPS. Fellows in training were excluded. A personal informed consent form was included, as well as permission for publication.

The questionnaire was sent three times in 10-day intervals, by e-mail and professional forum lists, and was available for 1 month (September 2021). No financial compensation was offered. The data was anonymized.

Institutional ethics committee permission was waived, as the research did not involve patients or institutional data, and each individual consented to the analysis and eventual publication of their data.

A descriptive and comparative statistical analysis was done. Discreet/categorical variables were analyzed with chi-square tests with Yates compensation.

## Results

CIPE has 407 associated females, and 178 responded to the questionnaire, with 4 exclusions (females still under fellowship). A hundred seventy-four (174)

questionnaires were analyzed (43.73% of CIPE-associated female surgeons).

The geographic distribution of our statistical sample was parallel to the distribution of pediatric surgeons in Brazil, with a predominance of southeast, southern, and northeast provinces (52.25%, 15.72%, and 15.72%, respectively).

The age distribution of the responders varied between 29 and 70 years old (mean 42). The sample was divided into  $< 40$  years old ( $n = 83$ , 44.7%, mean 34.39 years old, 29–39) and  $\geq 40$  years old ( $n = 91$ , 52.3%, mean 48.95 years old) BFPS, as most females in the general population have their families under 40 years of age.

Approximately, 2/3 of the BFPS have at least one child (62.22%). Approximately, a fifth (21.98%) of the 40-year-old BFPS have children, as compared to 46.99% of those  $\geq 40$  years old ( $p = 0.000899$ ), showing that BFPS frequently start their families relatively late.

Ages at the end of fellowship varied between 25 and 38 years old (mean 30.27), 1.29 years higher among the younger BFPS (mean age of 29.66 and 30.95, in the  $\geq 40$  years old and  $< 40$  years old, respectively), reflecting longer periods for specialization and medical school graduation at an older age in the younger groups.

Seventy-three women (41.95%) are financially responsible for their families, while 72 (41.38%) share expenses equally with their partners, and 13 (7.47%) have no financial responsibility for their families (5 BFPS did not respond). Except for a tendency to share family expenses in the younger (40 years old) group ( $p = 0.03707$ ), we found no differences in financial responsibilities toward family between younger and older BFPS or those with children or childless.

Most BFPS were in stable heterosexual relationships during fellowship ( $n = 125$ , 71.84%). Forty-five reported non-stable/eventual heterosexual relationships during fellowship (25.86%). Four reported non-heterosexual choices (2.3%), and three were celibate during specialization (1.72%). One woman did not respond to this question. Considering the limited number of non-heterosexual BFPS, sexual orientation will not be analyzed further. Relationship status did not vary significantly between  $\geq 40$  and  $< 40$ -year-old groups.

During the fellowship, most ( $n = 129$ , 71.14%) used some form of continuous contraception (contraception pills, intrauterine device). A smaller group used contraception methods as needed (diaphragm, condom, postcoital hormonal contraception) ( $n = 37$ , 24.03%). Only one did not use any contraception method. Five reported sexual abstinence, one related to an infertile partner, and another reported exclusive homosexual relationships. There was a significant predominance of

continuous contraception during fellowship among the < 40-year-old group ( $p = 0.038658$ ).

Most BFPS planned children after fellowship ( $n = 142$ , 81.61%), either immediately ( $n = 33$ , 18.97%) or after a period of insertion/stabilization in the professional market as consultants ( $n = 109$ , 62.64%), with no significant differences between  $\geq 40$  and < 40 year-old women. Nine (5.17%) did not plan children (as expected, this group was concentrated among childless BFPS,  $p = 0.0087$ ). Five feel pregnant during fellowship (non-planned pregnancy) and 3 while using highly effective continuous contraception methods. More  $\geq 40$  year olds reported not desiring children as compared to < 40-year-old BFPS ( $n = 8$ , 8.79% and  $n = 1$ , 1.2%, respectively,  $p = 0.0555$ ).

Data considering BFPS under a stable relationship during fellowship ( $n = 124$ ) in what concerns pregnancy planning shows that 22 BFPS (17.74%) reported that their position corresponded to a personal option without conflicts with their partner, 86 (69.35%) described their planning as a couple's agreement, and 11 (8.87%) reported marital conflicts secondary to the refusal of getting pregnant soon, with no significant differences when comparing  $\geq 40$  and < 40-year-old women.

Thirty-two BFPS (18.39%) are childless to the moment as a personal choice (mean age 36.63, median age 33 years old). This choice largely predominates among younger women ( $n = 24$ , 28.92% and  $n = 8$ , 8.79% among < 40 and  $\geq 40$ -year-old BFPS, respectively,  $p = 0.00399$ ). Twelve women (6.9%) do not have children due to infertility (mean age 46.17 years old, median age 43, 35–70 years old), mostly  $\geq 40$ -year-old BFPS ( $n = 2$ , 2.41% and  $n = 10$ , 10.99% among < 40 and  $\geq 40$ -year-old BFPS, respectively,  $p = 0.053457$ ). Thirteen BFPS (7.47%) report not having children because they are not in a stable relationship (mean age of 35.69, the median age of 34 years old). Five women (2.87%) were pregnant while responding to the questionnaire (mean age 34.8, median age 34, interval 32–37 years old).

Data about pregnancies are in Tables 1 and 2. Time off during and after pregnancy was difficult to analyze due to multiple jobs with different regulations in Brazil being frequent among physicians. Four women directly complained of the loss of protective rights due to nonregulated jobs, which have predominated recently as the form of employment available for physicians in recent years in Brazil.

Women, in general, chose not to leave their jobs during pregnancy, except for medical reasons. Time off after pregnancy was directly related to having or not having law-regulated stable jobs with predictable paid maternity leave, varying from 0 to 300 days (mean 98.66, median 90, SD 61.14 days).

**Table 1** Number of spontaneous abortions

Non-intentional abortions	N (mean)	Age at end of fellowship (mean)
BFPS, total	0.31 <sup>a</sup>	30.27
BFPS with children	0.42	30.07
Childless BFPS	0.14	30
General population	0.15 <sup>b</sup>	-

<sup>a</sup> 0.27 when excluding a women that presented 8 spontaneous abortions

<sup>b</sup> DATASUS, <http://tabnet.datasus.gov.br/cgi/tabcgi.exe?pnspnsr.def>, as accessed in November 1, 2021

Obstetric problems were common. Almost  $\frac{3}{4}$  (73/110, 63.36%) of the women with children reported at least one, 20 (18.18%) reported a high-risk pregnancy needing absence from work for medical reasons, and 14 (12.73%) had miscarriages (13 early and 1 late). There were 10 cases of hypertension secondary to pregnancy (9.09%), 4 premature deliveries (3.64%), and 2 (1.82%) cases of severe fetal diseases or malformations.

Eighty-seven BFPS (50%) reported no adverse consequences of postponing pregnancy, but 12 (6.9%) were childless forever, 29 (16.67%) had fewer children than planned, 19 (10.92%) were submitted for infertility treatment, and 6 (3.45%) had serious marital relationship problems related to pregnancy postponement.

Professional problems related to pregnancy or motherhood were reported by 65/110 BFPS (59.09%) with children:

- Thirteen (11.82%) reported being attacked either because of being pregnant during fellowship ( $n = 3$ ) or because of changes in working schedules during their pregnancy ( $n = 10$ ).
- Thirty-three (30%) reported being removed from surgeries during pregnancy (12 involuntary, 21 voluntary). Voluntary dismissal from surgeries was mostly restricted to the first trimester ( $n = 17$ ), but 4 BFPS opted for no operating room activity during the entire extension of pregnancy. Two reported worries about being exposed to volatile anesthetics during pregnancy, and seven recalled abortions attributed to volatile anesthetics among fellow BFPS.
- Eleven (10%) reported losing job opportunities because of being pregnant.

BFPS reported frequent professional problems related to planning pregnancy, risk of pregnancy, or actual pregnancy:

**Table 2** Pregnancies and infertility among BFPS

	BFPS ( <i>n</i> = 174)	BFPS ≥ 40 yo ( <i>n</i> = 91)	BFPS < 40 yo ( <i>n</i> = 83)
No pregnancies reported	47 (20.01%)	12 (13.19%)	35 (41.17%) <i>p</i> = 0.000036
Pregnancy as desired	72 (41.38%)	42 (46.15%)	30 (36.14%) <i>p</i> = 0.236965
Pregnancy after > 1 year of trial	20 (11.49%)	14 (15.38%)	6 (7.23%) <i>p</i> = 0.147965
Infertility treatment	11 (6.32%)	8 (8.79%)	3 (3.61%) <i>p</i> = 0.275855
Gave up without infertility treatment	2 (1.15%)	2 (2.2%)	0
Trying pregnancy (under treatment) or adoption with infertility diagnosis	4 (2.3%)	2 (2.2%)	2 (2.41%) <i>p</i> = 0.679419
Clinical criteria for infertility	39 (22.41%)	27 (29.67%)	12 (14.46%) <i>p</i> = 0.026319
Term pregnancies (mean)	1.07 (0–4)	1.38 (0–4)	0.71 (0–3)

- Three (1.72%) reported the loss of professional opportunities because of planning a future pregnancy, 13 (7.47%) were passed over for a male colleague because of the risk of becoming pregnant, and 1 (0.57%) was threatened with losing her position in case of pregnancy. Seventeen (9.77%) reported losing professional opportunities due to having young children. Thirty-seven (21.26%) were bullied either by colleagues (*n* = 21) or by superiors (*n* = 16) because of an actual or possible/future pregnancy.
  - Twelve (6.9%) were threatened with not being accepted into fellowship in the event of planning a pregnancy or being refused as a candidate for fellowship because of the risk of getting pregnant (*n* = 3, 1.72%). The ages of those 15 women varied between 32 and 55 years of age, attesting that this situation is not historical and has not disappeared contemporaneously.
  - Ten (5.75%) were directly told that a future pregnancy would harm their career forever, but many more BFPS (*n* = 34, 19.54%) reported “fear” of getting pregnant and harming their professional careers forever. The other 2 declared that they had been fearful of declaring themselves pregnant to their colleagues/superiors.
  - Ninety-five BFPS (86.36% of the women that were mothers) admitted to difficulties in conciliating professional duties and motherhood. Among BFPS that were mothers, 88 (80%) reported a reduction in professional schedules, 69 (62.73%) lost professional opportunities, 107 (97.27%) reduced their on-call scales, and 36 (32.73%) reduced or eliminated their private sector professional activities due to family obligations.
  - Sixty-nine (62.73%) women reported a need to earn better salaries in order to pay for child care (including household employees).
  - Forty-six (26.44%) women reported quarrels with their partners because of conflicts between work and child/family care.
- Females were the main ones responsible for child care in 12 (10.91%) families. Child care was mainly provided by relatives (*n* = 22, 20%), paid household employees (*n* = 48, 43.64%), or school/daycare (*n* = 6, 5.45%). Fifteen BFPS (13.64%) reported shared responsibility with their male partners.
- The BFPS's views on the optimal time for pregnancy and its consequences varied greatly (Table 3). Four women (2.3%) reported being afraid of future infertility because of their older colleagues' personal experiences.

**Table 3** Opinions about ideal timing for pregnancy among BFPS

Ideal timing for pregnancy, <i>n</i> (%)		Consequences of delaying pregnancy after fellowship, <i>n</i> (%)	
Before fellowship	1 (0.53%)	Reasonable and not harmful	19 (10.92%)
After fellowship	33 (18.97%)	Necessary, as pregnancy harms fellowship irrecoverably	5 (2.87%)
After professionally stable	37 (21.26%)	Necessary, as pregnancy harms fellowship, despite being recoverable	30 (17.24%)
Before 35 years old	37 (21.26%)	Necessary, as pregnancy harms fellowship irrecoverably but unfair to females	9 (5.17%)
Depending on the woman's choice	57 (32.76%)	Reasonable but imposing higher risks of future infertility	93 (53.45%)
There is no good moment	2 (1.15%)	Not needed	13 (7.47%)
After fellowship if mother's age allows	1 (0.53%)	Responsible motherhood is impossible for a BFPS	2 (1.15%)

## Discussion

The distribution of BFPS differs from that of females in Brazil (8.1, 27.9, 42.4, 14.3, 7.3 in the north, north-east, southeast, south, and center regions, respectively) [5]. The predominance of BFPS in the southeastern and southern provinces (67.97% of FPBS in our research), confirms previous research, that proved that the distribution of pediatric surgeons was highly influenced by the availability of financial and working professional guarantees [6, 7]). Most referral hospitals, formative and attending centers for pediatric surgery, are located in these relatively prosperous regions.

According to IBGE (Brazilian Institute for Geography and Statistics, a governmental institution responsible for population census in Brazil), 86.6% of  $\geq 40$ -year-old Brazilian females have at least one child. Parity in urban populations concentrates on younger ages (74.6% of Brazilian women become mothers before their 35th birthday [5]). Only 4.9% has their first pregnancy after 39 years of age.

High-quality data about Brazilian females are not available, unfortunately. In our research, approximately 2/3 of BFPS have at least one child ( $\geq 40$ -year-old population parity of 1.38), significantly lower than that of Brazilian female population (1.77 children per woman [5]). Moreover, only 21.98% of the  $< 40$ -year-old BFPS group (mean age 34.39 years old) have children, suggesting that BFPS start their families in the last half of their 30s or early 40s, reflecting practical and cultural difficulties in the professional environment, especially previously/during fellowship, and the financial limitations of BFPS at the beginning of their career.

The intention of postponing pregnancy even under stable relationships is clear in our cohort; 71.94% was under stable relationships, 71.14% used a continuous highly effective contraceptive method, and 81.64% declared their desire to have children after completing training (62.64% after a period of stabilization as a consultant).

Postponement of pregnancy after training is common among female surgeons (52% of orthopedic surgeons [8], 72.6% of plastic surgeons [9]), despite their interest in motherhood (94.83% of BFPS in this cohort, 94% of neurosurgeons [8], 79.9% of plastic surgeons [9]). Pregnancy deferral seems to be related to gender, not to professional training: only 39.2% of male plastic surgeons postponed paternity because of work or training strains [9].

Previous research in Brazil comparing female medical and law students (equal prestige careers and similar social backgrounds) detected that only 10–15% showed no interest in getting pregnant in both careers but for different reasons; while medical students prioritized their careers and thought that maternity would impair their professional future, law students gave up maternity to privilege personal life projects. This paper also showed

that medical students were older, an important difference when added to the need for postgraduation training, especially for those intending to become surgeons [10].

Most BFPS are  $\geq 30$  years old at the end of obligatory training, and they plan to start a family after a period of insertion in the professional market and will generally impose a first pregnancy after 35 years of age, which relates to lower parity, higher rates of miscarriage, and need for infertility treatment [11, 12]. Unfavorable consequences of postponing pregnancy (undesired childlessness, having fewer children than desired, and needing treatment for infertility) affected approximately a third of the BFPS interviewed. The option of germ-cell freezing was considered by a few but used only by one woman, mainly due to financial restraints.

Older ages in their first pregnancy, as compared to the general population, were also reported in neurosurgeons (32.1 versus 26.3 years old) [13]. This was comparable to a bigger cohort of 1021 female surgeons from North America coming from different specialties; the mean age at first pregnancy was 33 years old (35.8 when IVF was needed) versus 23 in the general population. Almost a third experienced infertility (10.9% in the general population). Eighty-four percent of the infertile surgeons were treated (versus 11% in the general population), and 13% of the children were born after IVF [1]. Higher rates of infertility were confirmed among female plastic surgeons (26.3%) [9]. A recent review confirmed those findings, with 30–32% of infertility and 8–13% of assisted reproduction among female surgeons [14, 15]. Japanese female surgeons reported 20% of fertility treatments, 1/3 of adverse events during pregnancy, and 33% miscarriages [16]. Orthopedic female surgeons showed high frequencies of obstetric complications (31.2% versus 14.5% in the general population) and prematurity (*OR* 2.5 as compared to females with comparable ages and from similar socioeconomic strata) [15], need for IVF in 106/853 successful pregnancies, and a high incidence of miscarriages (38%) [8].

Unfavorable consequences of pregnancy during the fellowship, including differences in attrition, caseload, or exam pass rates, have not been consistently demonstrated [14]. A policy encouraging earlier pregnancies among surgical trainees could be beneficial to women's reproductive health, but changes in training structure are required, such as accepting part-time work and/or extending the predicted training period. In real life, this is not easily accomplishable, especially in small programs with a strong internal culture such as pediatric surgery.

Stigma against pregnancy during training persists despite all the progress and debate concerning equality and female inclusion in the surgical working environment; 76% of females graduating  $\geq 30$  years ago

complained of prejudice as compared to 67% graduating in less than 10 years, mainly from males and older professionals [9].

Marital conflicts secondary to postponing pregnancy were relatively common (8.87% of BFPS reported this during fellowship), as well as quarrels about child care (reported by a quarter of BFPS). Difficulties with taking care of children affecting marital relationships have also been reported by Japanese neurosurgeons [17].

Most female surgeons (85.6%) work on a non-modified scale during pregnancy. Many restrain operating room activities for fear of fetal toxicity from volatile anesthetics, and 2/3 worry about their own and their fetus' health. Time off after pregnancy and protection during pregnancy were clearly problematic.

While BFPS working under labor-protective Brazilian laws [4] had a reasonable paid out-of-work period after delivery, those working under pay-for-task regimens had to return to work in extremely short periods, precluding adequate puerperium and lactation. This problem is likely to worsen, as the availability of salaried and stable jobs for BFPS is quickly declining in Brazil.

Among North American orthopedic surgeons, maternity leave was reported as limited (a mean of 4.6 weeks for the first child and 8.2 weeks for the second) and costly (mean of US \$3000/week) [18]. Academic surgeons report that motherhood delayed their career progress, while surgeons in private practice reported being pressured to take longer leaves and high financial costs/losses from maternity leave [19]. Limited maternity leave and breastfeeding support lead to the early abandonment of breastfeeding in a high proportion (58.1%) of North American female surgeons [2].

Among BFPS, 41.95% of women are the sole or primary financial provider for the family (versus 33.2% of families earning more than double the national minimum wage and 32.2% of families with at least one minor child under the age of 6 in the general population) [5]. This may be related to physicians earning better salaries than their partners in other professions or to a higher frequency of non-married/divorced BFPS. Despite being responsible or co-responsible for the household expenses, only 13.64% of BFPS shared responsibilities for child care with their husbands. A quarter of female Japanese surgeons report changing or leaving jobs after becoming mothers and related this to familial problems related to being the sole responsible for child care [16]. Our interviewees acknowledged having had to adapt their working schedules to motherhood.

Overly intimidation, unfairness, and mistreatment of female physicians because of pregnancy risk and pregnancy per se still occur. Discrimination by co-workers has been reported by 77% of female neurosurgeons who

are mothers [16]. American surgical fellows and female Japanese surgeons also registered harassment about pregnancy [2, 16]. BFPS tend to have personal conflicts about having children and risking their careers, are "afraid" of getting pregnant, and communicate their pregnancy status to colleagues and superiors. Difficulties in conciliating motherhood with their professional duties lead to the need for more money to cover child care, and the help of the extended family is usually needed.

It is common for BFPS to resign from on-call opportunities and private work, leading to fewer opportunities and lower payments when compared to male colleagues. Female neurosurgeons (70.1%) also reported being afraid of their colleagues' criticisms and the effects of pregnancy on their careers and complained of problems in obtaining a reasonable work-life balance, "mother guilt," and sleep deprivation. Almost a fifth of Japanese neurosurgeons is reported to have abandoned full-time work, half of them due to motherhood difficulties. Most complained of problems with colleagues and a lack of support from co-workers [17]. Eighty percent of North American female neurosurgeons reported microaggressions, 95% of which were related to gender [20]. Two-thirds of the candidates for a fellowship in orthopedics reported being asked inappropriate questions about marital status, pregnancy plans, and/or raising children during fellowship as late as 2019 [21].

A hostile environment and life project/career conflicts may lead to the abandonment of a future as surgeons or of surgical training per se. The absence of successful female mentors/leaders and the perceived failure of female pediatric surgeons in what concerns career-life balance and/or a career comparable to males may be responsible for the abandonment of the project of becoming a pediatric surgeon. As recently as 2018, Rangel et al. found that 39% of females considered leaving surgical fellowship in general surgery, and nearly 1/3 would discourage females from pursuing a surgical career [2]. Not surprisingly, female surgeons tend to be less satisfied with their professional choices than male peers, and this is not related to wages, as demonstrated by a survey in the Netherlands, with male and female neurosurgeons earning similar salaries [22].

Our research has some limitations. Our sample size is small, and only 43.73% of BFPS associated with CIPE responded to the questionnaire. However, this proportion is similar to or higher than most of the published surveys of this kind. The number of available pediatric surgeons is limited; pediatric surgeons are a minority among surgeons globally, and fellows were excluded from the survey. We cannot exclude the possibility of bias, particularly a possible predominance of younger professionals and those more worried about or more

affected by obstetric problems among the interviewees. We also do not know the ages of the mothers when their first child was born, but our data is sufficient to attest to the lower parity/fertility and older ages of BFPS in their first delivery, considered as a group.

In conclusion, BFPS presents high taxes of infertility (22.41%) and childlessness (6.9%). Those who are mothers frequently have fewer children than desired (16.27%). This is probably related to their age after obligatory training and insertion as junior consultants, as well as to bullying and loss of professional opportunities related to pregnancy and having young children. Unfavorable consequences of postponing pregnancy affected a third of the total of BFPS, replicating data from other surgeons, including those from highly developed countries. A policy encouraging earlier pregnancies among surgical trainees and junior professionals would benefit women's reproductive health, but the stigma associated with pregnancy during training persists. Time off after pregnancy and protection during pregnancy were also clearly problematic and depended, at least partially, on governmental labor policies. Overly intimidation, unfairness, and mistreatment of female physicians related to gender still occur. Hostile environments and conflicts between life project and career may lead to the abandonment of a future as surgeons and of surgical training per se for those that have already been admitted to a fellowship. Successful female mentors/leaders would probably help the professional insertion of females as pediatric surgeons, as well as the attainment of a satisfactory work-life balance for females in the profession.

#### Abbreviations

BFPS: Brazilian female pediatric surgeon(s); CIPE: Brazilian Association of Pediatric Surgery.

#### Supplementary Information

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Additional file 1.

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#### Authors' contributions

LEJ: research conceiving, planning and design, design of the questionnaire, data analysis, manuscript drafting, and review. AGR: data acquisition, data analysis, and manuscript review. LNSSO: data acquisition, data analysis, and manuscript review. KF: data acquisition, data analysis, and manuscript review. RRJ: data acquisition, data analysis, and manuscript review. GCR: data acquisition, data analysis, and manuscript review. SD: data analysis, research supervision, and manuscript review. The authors read and approved the final manuscript.

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#### Availability of data and materials

Data are available under request to the main author.

#### Declarations

##### Ethics approval and consent to participate

Institutional ethics committee permission was waived, as the research did not involve patients or institutional data, and each individual consented to the analysis and eventual publication of their data.

##### Consent for publication

Each individual consented to the analysis and eventual publication of their data before responding to the questionnaire.

##### Competing interests

The authors declare that they have no competing interests.

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