Canadian Medical Education Journal

Original Research

Gender disparity in delayed childbearing among medical trainees in Ontario

Disparités entre les sexes en matière de procréation différée chez les médecins résidents en Ontario

Catherine L Friedman,[1] Sarah Saliba,[1] Azraa Janmohamed,[1] Kestrel McNeill,[1] Shirin Dason,[2] Megan F Karnis[3]

[1]Department of Obstetrics and Gynecology, McMaster University, Ontario, Canada; [2]Mount Sinai Fertility, University of Toronto, Ontario, Canada; [3]ONE Fertility, Ontario, Canada

Correspondence to: Catherine L. Friedman – Hon. BSc, BScN, MD, Department of Obstetrics and Gynecology, McMaster University. 1280 Main St W, Hamilton, ON L8S 4L8; email: catherine.friedman@medportal.ca

Published ahead of issue: May 27, 2025; published: Sept 10, 2025; CMEJ 2025, 16(4) Available at https://doi.org/10.36834/cmej.80415

Abstract

Objective: Physicians report high rates of delayed childbearing and are at increased risk of infertility and pregnancy loss. There are limited studies on this topic in the Canadian context, particularly for trainees. Our objective was to explore Ontario medical trainees' experiences with and knowledge of delayed childbearing, infertility, and fertility treatments.

Methods: We administered a cross-sectional survey to all residents and fellows in Ontario. Descriptive statistics, multiple regression, and thematic analysis of free text responses are used to present the findings.

Results: 460 trainees responded to the survey. Over half (57%) intentionally delayed childbearing due to medical training, with long working hours being the most cited reason (82%). Cis women were 85% more likely to delay family initiation than cis men. Rates of early pregnancy loss (17%) were similar to that of the Canadian average for this age group, while rates of infertility (14%) were slightly higher. Knowledge gaps were identified, with trainees scoring 62% on knowledge questions around age-related fertility decline and fertility treatment. The majority (73%) felt their programs were supportive of family initiation during training, with top areas for change identified as increased flexibility with working hours, and increased protected time for required extracurricular activities.

Conclusion: Trainee physicians in Ontario report high rates of delaying family initiation due to training, with greater impacts on cis women compared to cis men, and slightly higher rates of infertility. Addressing knowledge gaps is one way to empower trainees to make informed family planning decisions going forward.

Résumé

Objectif : Les médecins signalent des taux élevés de procréation différée et courent un risque accru d'infertilité et de fausses couches. Il existe peu d'études sur ce sujet dans le contexte canadien, en particulier pour les médecins résidents. Notre objectif était d'explorer les expériences et les connaissances des médecins résidents de l'Ontario en matière de procréation différée, d'infertilité et de traitements de fertilité.

Méthodes : Nous avons mené une enquête transversale auprès de tous les résidents et moniteurs de l'Ontario. Des statistiques descriptives, une régression multiple et une analyse thématique des réponses libres ont été utilisées pour présenter les résultats.

Résultats : Au total, 460 médecins résidents ont répondu à l'enquête. Plus de la moitié (57 %) ont intentionnellement retardé leur grossesse en raison de leur formation médicale, les longues heures de travail étant la raison la plus souvent citée (82 %). Les femmes cisgenres étaient 85 % plus susceptibles de retarder la fondation d'une famille que les hommes cisgenres. Les taux de fausses couches précoces (17 %) étaient similaires à la moyenne canadienne pour ce groupe d'âge, tandis que les taux d'infertilité (14 %) étaient légèrement plus élevés. Des lacunes dans les connaissances ont été identifiées, les médecins résidents obtenant un score de 62 % aux questions portant sur la baisse de la fertilité liée à l'âge et les traitements de fertilité. La majorité (73 %) estimait que leurs programmes favorisaient la fondation d'une famille pendant la formation, les principaux domaines à améliorer étant la flexibilité des horaires de travail et l'augmentation du temps protégé pour les activités extrascolaires obligatoires.

Conclusion : Les médecins résidents en Ontario signalent des taux élevés de report de la fondation d'une famille en raison de leur formation, avec des répercussions plus importantes sur les femmes cisgenres que sur les hommes cisgenres, et des taux d'infertilité légèrement plus élevés. Combler les lacunes dans les connaissances est un moyen de donner aux médecins résidents les moyens de prendre des décisions éclairées en matière de planification familiale à l'avenir.

Introduction

Female physicians are at increased risk of infertility, miscarriage, and recurrent pregnancy loss.[1,2,3] Reasons for these complications include purposeful delayed childbearing, older age at time of family initiation, and occupational hazards such as consistent night shift work and long working hours.[1,4,5] While studies focused on the trainee population are more limited, similar trends have been reported. A recent systematic review identified that female surgical residents had their first child later in life, and experienced higher rates of infertility and miscarriage than the general population.[6] Similarly, a survey of 299 United States trainees found that over half had delayed childbearing, identifying limited time, work flexibility, and financial concerns as major factors.[4]

There are few studies to date that have explored the experiences of medical trainees in Canada surrounding delayed childbearing, infertility, and decision to pursue fertility treatments.[6] Our public healthcare system and established provincial residency professional associations may have important impacts on trainees in Canada as compared to those in the United States. The objective of this pilot study was to describe Ontario trainees' knowledge of and experiences with delayed childbearing, infertility, fertility treatment, and fertility preservation. We also sought to explore trainees' knowledge of benefits and funding available, and identify strengths and weaknesses of training programs in supporting trainees through these issues. We hypothesized that trainees would report high rates of delayed childbearing, higher rates of pregnancy loss and infertility, and note barriers to accessing fertility care during training.

Methods

Study design

We administered a cross-sectional survey to residents and clinical fellows across all medical specialties in Ontario using the secure online survey tool, REDCap. We recruited participants via email through program administrators, social media, and snowball sampling, and participation was incentivized with an optional gift card draw funded by a grant from the Department of Obstetrics and Gynaecology at McMaster University. In addition to basic demographic questions, the survey contained five groups of questions that captured respondents' reproductive characteristics, desires to preserve fertility, experiences with infertility and fertility treatment, perception of program support, and finally, knowledge of government funding of fertility treatments and insurance benefits (Appendix A). Response options varied per question and included multiple choice, 5-point Likert scales, select all that apply, and free text. We piloted the survey with three trainees external to the research team who provided input on question clarity and consistency, prior to distribution. The survey questions were adapted from previous studies, including the aforementioned United States study focused on the fertility experiences of medical residents and fellows, and knowledge questions were derived from a validated survey.[4,7] Additional demographic questions such as those exploring ethnicity and childhood household income were not included in service of maintaining a short survey with a particular focus on gender, relationship status, and sexual orientation.

Data analysis

Descriptive statistics, including counts, proportions, and means, are used to present the survey findings, and were conducted using Microsoft Excel version 16.71. A series of multiple regression models were used to examine which factors made trainees more likely to delay family initiation, report infertility, pregnancy loss, and use of fertility treatment. Multiple regression models were developed for each respective outcome using a backwards approach to feature selection based on the Akaike Information Criterion, and calculations were performed using R, version 4.4.1.[8] Independent variables included in the regression models are the characteristics listed in each table (e.g. gender, age, specialty), while dependent variables included in the model are the fertility factors studied (e.g. delayed family initiation, infertility). Lastly, open-ended free text responses were qualitatively analyzed by grouping common ideas into themes using a content analysis approach.[9] Ethics approval was obtained from the Hamilton Integrated Research Ethics Board (HIREB study #14933).

Results

The survey was open from November 2023 to March 2024. A total of 460 trainees consented to participate, with 381 completing every question of the survey (Table 1). We achieved a diverse respondent pool with respect to age, program of study, relationship status, and trainee role. Eighty percent of respondents identified as female, which is higher than the proportion of female trainees in Ontario (55%).[10] Responses were received from trainees across all Ontario institutions, with a few institutions represented in higher proportions due to administrators at those locations agreeing to disseminate the survey to their trainees. Due to the method of recruitment used, an accurate response rate could not be calculated (i.e. the true number of

trainees reached via email and snowball sampling is not known). The total number of trainees practicing in Ontario is not yet published for this academic year, but averages around 5,000. If all Ontario trainees received the survey, the resulting response rate would be approximately 9%.[10]

Table 1. Summary of participant demographics

Demographic	Response Options	n	%
Respondents		460	100
Mean Age, range		30.8	23-59
Gender	Cis Woman	344	80.9
	Cis Man	78	18.4
	Non-binary	1	0.2
	Prefer not to say	2	0.5
Orientation	Heterosexual	381	89.6
	Gay	4	0.9
	Lesbian	3	0.7
	Bisexual	28	6.6
	Queer	8	1.9
	Other	4	0.9
	Prefer not to say	4	0.9
Relationship Status	Single	63	14.8
	Married	202	47.5
	In a relationship	150	35.3
	Other	6	1.4
	Prefer not to say	4	0.9
Role	Resident	291	68.5
	Fellow	132	31.1
PGY Level	PGY1	72	16.9
	PGY2	70	16.5
	PGY3	60	14.1
	PGY4	66	15.5
	PGY5	66	15.5
	PGY6 to 8	66	15.5
	Other	25	5.9
Program of Study	Primary care	62	14.6
	Medicine	173	40.7
	OBGYN	31	7.3
	Surgery	72	16.9
	Diagnostic & Lab medicine	21	4.9
	Other	66	15.5
Institution	1	182	42.8
	2	2	0.5
	3	36	8.5
	4	154	36.2
	5	34	8
	6	5	1.2
	Prefer not to say	12	2.8

Reproductive characteristics

Twenty-seven percent of respondents had children, reporting an average age of 30.4 years at the time of having their first child. The majority of trainees (57%, *n* = 241) responded that they had intentionally delayed plans to have children due to residency or fellowship, with the top five reasons for delaying being: long working hours (82%, *n* = 196), training requirements such as examinations (72%, *n* = 172), burden of additional workload at home (69%, *n* = 165), desire to not defer training completion (67%, *n* = 159), and financial cost of having children (61%, *n* = 147) (Figure 1).

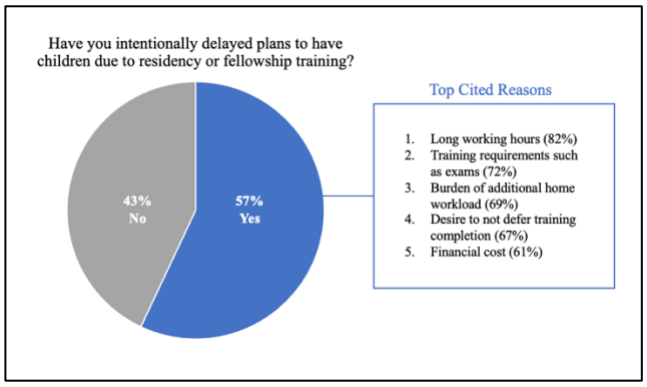

Figure 1. Delayed Family Initiation Rate and Top Five Cited Reasons

A minority of respondents indicated that pressure from their training program (10%, *n* = 25) or program director (1%, *n* = 3) were reasons to delay having children. Regression analysis revealed that cis women had 85% higher odds of reporting delayed family initiation compared to cis men (OR=1.85, 95% CI [1.01, 3.43], p = 0.0049), and those in relationships or who were married were two to three times more likely to delay family initiation compared to those who were single, respectively (OR = 2.62, 95% CI [1.28, 5.52], *p* = 0.01, OR = 3.45, 95% CI [1.67, 7.33], *p* = 0.001). Those in postgraduate year 2 (PGY2) also had a 61% lower odds of delaying family initiation compared to those in PGY1 (OR = 0.39, 95% CI [0.18, 0.83], *p* = 0.016) (Table 2 and 3).

Fifty-nine trainees left free-text responses about additional factors impacting their decision-making, and several common themes were identified. Most frequently, 25% (*n* = 25) of responses stated that a lack of social supports during training resulted in their decision to delay, with many commenting on separation from their families or partners due to the residency or fellowship match. Many also reflected on a gender disparity relating to the impacts of starting a family during training, with one stating:

> *I personally think it's very hard for female physicians to decide whether or not to have kids earlier […] as timings of residency and medical school coincide with prime reproductive years. I wish there were enough support to female physicians and residents with young kids so that they can flourish professionally as much as male doctors can.*

Table 2. Multivariable regression tables for the outcome of delayed family initiation. Initial preliminary Significant p-values are bolded. OR = Odds ratio, CI = confidence interval.

Characteristic		OR	95% CI	p-value
Gender	Cis Man	-	-	
	Cis Woman	1.85	1.01, 3.43	**0.0049**
Sexual Orientation	Heterosexual	-	-	
	Not heterosexual	1.33	0.63, 2.86	0.5
Age		0.99	0.92, 1.07	0.8
Relationship Status	Single	-	-	
	In a relationship, not married	2.62	1.28, 5.52	**0.01**
	Married	3.45	1.67, 7.33	**0.001**
Role	Resident	-	-	
	Fellow	1.03	0.46, 2.32	>0.9
Postgraduate Year (PGY) Level	PGY1	-	-	
	PGY2	0.39	0.18, 0.83	**0.016**
	PGY3	1.12	0.51, 2.49	0.8
	PGY4	1.47	0.64, 3.39	0.4
	PGY5	1.23	0.51, 3.02	0.6
	PGY6	2.25	0.67, 8.07	0.2
	PGY7	2.84	0.64, 14.5	0.2
	PGY8	2.02	0.40, 12.2	0.4
	Other	2.26	0.56, 9.93	0.3
Program of Study	Non-surgical	-	-	
	Obstetrics & Gynaecology	1.10	0.65, 1.86	0.7
	Surgical	0.86	0.37, 2.06	0.7

Fertility preservation

One quarter (*n* = 106) of all respondents considered fertility preservation during their training. Eleven percent (*n* = 48) had seen or been referred to a fertility specialist for fertility preservation planning, with 4% (*n* = 18) having completed fertility preservation. The most cited reasons for preservation identified in the thematic analysis were age, flexibility with career planning, and wanting to wait until training completion to have children. Many trainees also noted a "fear of infertility," and felt that preservation would provide assurance for the future.

Table 3. Multivariable regression results following backwards stepwise approach to feature selection, with significant characteristics displayed. Multivariable regression tables for the outcome of delayed family initiation. Initial preliminary Significant p-values are bolded. OR = Odds ratio, CI = confidence interval.

Characteristic		OR	95% CI	p-value
Gender	Cis Man	-	-	
	Cis Woman	1.85	1.02, 3.41	**0.045**
Relationship Status	Single	-	-	
	In a relationship, not married	2.47	1.22, 5.13	**0.013**
	Married	3.18	1.59, 6.53	**0.001**
Postgraduate Year (PGY) Level	PGY1	-	-	
	PGY2	0.39	0.18, 0.84	**0.016**
	PGY3	1.12	0.51, 2.47	0.8
	PGY4	1.47	0.67, 3.19	0.3
	PGY5	1.23	0.55, 2.76	0.6
	PGY6	2.28	0.85, 6.69	0.11
	PGY7	2.81	0.80, 11.6	0.12
	PGY8	2.06	0.52, 10.4	0.3
	Other	2.14	0.72, 6.95	0.2

Experiences with infertility, loss, & fertility treatment

Of those who did not delay trying to conceive, 17% (*n* = 46) reported experiencing early pregnancy loss, defined as loss of a pregnancy before 13 completed weeks of gestation. The mean age of those who reported pregnancy loss was 34.4 years (range 28 to 45). For cisgender women reporting pregnancy loss (who accounted for 77% of respondents reporting pregnancy loss), the mean age was 33.8 (range 28 to 40 years). Similarly, 14% (*n* = 37) of those who had not delayed trying to conceive reported infertility, defined as not achieving a pregnancy after 1 year of regular sexual intercourse without using contraception. The mean age of those who reported infertility was 33.8 years (range 25 to 42). For cisgender women reporting infertility (who accounted for 80% of infertile respondents), the mean age was 33.6 (range 29 to 42).

Nine percent (*n* = 35) of trainees or their partners had gone through fertility treatment in the forms of ovulation induction, timed intercourse, intrauterine insemination (IUI), or in vitro fertilization (IVF), and 10% (*n* = 40) had considered it. The top anticipated and experienced barriers to treatment during training were financial costs (66%, *n* =

273), difficulty getting time off work (64%, *n* = 263), and anticipated difficulty managing side effects while working (61%, *n* = 254). Multivariable regression identified one factor as significantly associated with pregnancy loss and infertility, which was age; for every year increase in age, the odds of reporting pregnancy loss increased by 29%, and the odds of reporting infertility increased by 19% (OR = 1.29, 95% CI [1.18, 1.42], p<0.001; OR = 1.19, 95% CI [1.08,1.32], p<0.001) (Supplemental Tables 1 and 2). The odds of reporting fertility treatment during training were higher for those who were married compared to those who were single (OR = 3.36, 95% CI [1.19, 12.1], *p* = 0.037), those in surgical compared to non-surgical training programs (OR = 3.31, 95% CI [1.30,8.26], *p* = 0.011), and those who identified with sexual orientations other than heterosexual (OR = 2.46, 95% CI [1.02,1.19], *p* = 0.047). Age also demonstrated a significant association with fertility treatment, with there being a 10% higher odds of seeking fertility treatment for every year increase in age (OR = 1.10, 95% CI [1.02, 1.19], *p* = 0.016) (Supplemental Table 3).

Forty-eight free-text responses were thematically analyzed, revealing additional barriers to fertility care including: stigma associated with infertility and fertility treatment, inaccessibility to fertility care due to not having a family doctor or wait times to see a specialist, and concern for additional stress. Numerous trainees reported feeling unsupported around infertility and loss during training, with one stating:

> *I did have to take time off work for pregnancy loss issues and while people said things that were supportive, for example, "take all the time you need," the reality of finding people to cover your shifts and asking you to work was above and beyond what you would expect for any patient. I also felt that mental health was not part of the time needed to heal, it was more focused on physical health.*

Finally, the financial cost of fertility treatment was further elaborated on by many, especially for those in fellowship for whom benefits and drug coverage are sometimes not included.

Knowledge of fertility concepts & funding or insurance coverage available

Seven questions were included in the survey to assess trainee knowledge of basic fertility concepts. The mean score on the knowledge questions together was 62% (Figure 2). Trainees performed best on the true or false question, "Success rates of IVF decline with female age," with 95% (*n* = 379) correctly identifying that this is true. Conversely, only 30% (*n* = 122) of trainees correctly answered the true or false question, "Elective oocyte cryopreservation is a viable option to preserve fertility, including for those aged 40 years and beyond," for which the answer is false. Regarding knowledge of insurance coverage for medications and benefits available to Ontario trainees, the majority were unsure if the Professional Association of Residents of Ontario's (PARO's) insurance plan (66%, *n* = 275) or government funding (including from Ontario Health Insurance Plan (OHIP) and Ministry of Health) (55%, *n* = 229) covered any costs associated with fertility preservation or infertility treatment, including medications. One quarter (*n* = 103) of trainees correctly identified that PARO's insurance plan covers some associated costs, and similarly, 27% (*n* = 111) correctly identified that government funding covers some associated costs.

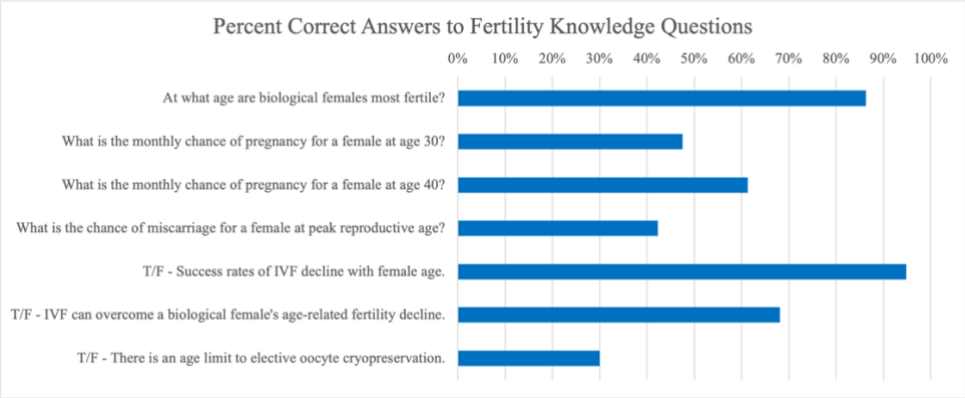

Figure 2. Mean Trainee Knowledge of Select Fertility Concepts. Abbreviated versions of questions are displayed, see appendix for complete question wording & multiple choice options

Program support

The majority viewed their programs as supportive of pregnant trainees (72%, *n* = 295) and trainees taking parental leaves (77%, *n* = 310). A clear majority of trainees (95%, *n* = 386) were supportive of their trainee colleagues having children during training. About half (53%, *n* = 217) disagreed that trainees having children during training place burdens on their colleagues; however, one quarter (26%, *n* = 105) agreed or strongly agreed that this was the case. Trainees reported strengths of their programs were: peers sharing similar experiences, program directors being supportive of parental leave, and mentors willing to discuss family planning and fertility.

The most frequently reported program weaknesses were onerous working hours (39%, *n* =158), lack of program flexibility with time away such as for fertility appointments or child illness (32%, *n* = 130), and co-trainee peers not sharing similar experiences (21%, *n* = 83). The most common theme identified was around concern for increasing call burdens on colleagues by going off call during pregnancy and/or parental leave. One trainee commented: "It is more work for the trainees without children. It needs to be acknowledged. It can cause resentment from both parties." Many trainees also noted experiencing push-back from supervisors around the PARO off-call requirement starting at 27 weeks of gestation. The top 3 priority changes to improve trainee support were: options for adjusted work hours for childcare considerations (63%, *n* = 82), adjustments to call schedules (44%, *n* = 59), and decreased extracurricular requirements or provision of more protected time for such activities (40%, *n* = 52). Many trainees also noted that when the resident workforce is reduced due to pregnancy or parental leaves, attending staff could make efforts to fill in gaps when possible, rather than to further increase resident workloads.

Discussion

We achieved 460 responses to the survey, with an estimated response rate of 9%, which is typical for large scale surveys of medical professionals, and is similar to that achieved by the Canadian Medical Association National Physician Health survey.[11] With this response rate, this sample may not be representative of all Ontario trainees. Strengths of the study are the diversity of respondents in terms of age, location, postgraduate year, and program of study.

Comparing our respondents to the general population in Canada, age at delivery of first child was 1 year older, with more than half of trainees reporting intentionally delaying family initiation (Table 4, Figure 1).[12] With growing literature demonstrating high rates of trainee burnout in Canada, it is unsurprising that trainees in our survey cited onerous working hours, training requirements, and concern for adding parenting to already busy workloads as reasons to delay having children.[16] Themes highlighting issues in the structure of our training system arose throughout the survey, and highlight a need for greater attention to strategies to achieve improved trainee work-life balance. Notably, in many sections of the survey, trainees commented on perceived gender disparities in the treatment of trainees who have children in residency, particularly noting that women physicians were more likely to face career challenges than their male counterparts. Our regression analysis showing that cis women have higher odds of delayed family initiation compared to cis men could also support that barriers to family initiation are experienced by women to a greater degree than men (Table 2). Volunteer bias may play a role in emphasizing this difference, since a greater proportion of women responded to our survey (approximately 80% of our respondents, compared to 55% of Ontario trainees); however, the overrepresentation of women in our sample likely relates to the greater impact of these issues on women, resulting in their greater motivation to participate.[10]

Table 4. Comparison of Ontario trainees to the general population in Canada, and 30 to 34 year old women in Canada.

	Ontario Trainees	General Population	30-34 Year Comparison
Age At Delivery of First Child	30.4	29.4[11]	N/A
Infertility Rate	14%	11.5-15.7%[12]	8.5-13.5%[12]
Early Pregnancy Loss Rate	17%	15-25%[13,14]	8-21%[13]

Other factors found to be significant in the multivariable analysis for delayed family initiation were relationship status and postgraduate year of study. It is likely that single respondents answered "no" more often than those in relationships or than those who are married to the question of whether they have decided to delay family initiation as many are not considering single parenting or family initiation as an option, thus not perceiving delayed family initiation as a decision at this time in their lives. For year of study, it is possible that those in PGY2 were less likely to delay family initiation than those in PGY1 due to closer proximity to graduation, particularly for family medicine programs, which are two years in length, or due to greater comfort with deciding to start a family after completing the first year of residency.

Regarding pregnancy loss and infertility, early pregnancy loss was reported by 17% of trainees who had tried to conceive. The rate is similar to the overall rate of clinical pregnancy loss in Canada, which is reported as 15-25% (Table 3).[14] The pregnancy loss rate in our study is similar to previous studies comparing miscarriage rates for this age group.[15] Infertility was reported by 14% of those who had tried to conceive in our study, which is at the higher end of the general population rate in Canada at 11.5 to 15.7%.[13] Comparing this to a Canadian study estimating the infertility rate for couples in which the female partner is 30 to 34 years (8.5 to 13.5%), the rate in our study is slightly higher.[13] The higher rate of infertility found in our study may be due to numerous factors including consistent night shift work, long working hours, and occupational hazards such as exposure to endocrine disrupting chemicals, in addition to volunteer bias, and a wider age range of those reporting infertility.[5]

With over half of respondents reporting delayed family initiation, many will be more likely to experience age-related fertility decline and early pregnancy loss after completing training simply due to age. Notably, the mean age of cisgender women reporting infertility in our study was 33.6 (ranging 29 to 42). This fits with existing literature demonstrating that attending physicians experience higher rates of infertility and pregnancy loss compared to the general population, and is supported by our regression analyses, which identified age as significantly associated with infertility, pregnancy loss, and use of fertility treatment.[15,18] Note that a study limitation is lack of availability of age-matched data for comparison.

In addition to age, the odds of reporting use of fertility treatment during training were higher for those who were married, in surgical training programs, and those identifying with sexual orientations other than heterosexual (Supplemental Table 3).Those who are married may be more likely to be in financial positions or traditionally “ready” positions to start their families than those who are single or in relationships who are not married. The stigma single women and unmarried couples may face in seeking fertility treatment may also explain some of this difference. Regarding program type, it is unclear why surgical trainees were more likely to use fertility treatment; possible explanations include that non-surgical trainees often have shorter training programs and may be more likely to wait until after training to start their families, or that surgical trainees may anticipate more flexibility with their schedules during training to complete fertility treatment and start or grow their families. While our study did not focus on the reasons for variation between programs, it is an important area to highlight in future research. Lastly, those who identified with sexual orientations other than heterosexual likely required fertility treatment more often simply on the basis of their sexual orientations (i.e. requiring use of gamete donation or surrogacy).

In the questions surrounding program and peer support, the majority of trainees recognized their programs were supportive, and the majority were themselves supportive of co-trainees starting or growing their families. There was, however, some dissonance identified, in that one quarter of respondents felt that trainees having children during training place burdens on their colleagues. Thematic analysis further supported this tension, primarily citing added workload for non-parenting trainees when trainees are pregnant or on parental leave, connecting again to greater themes around issues in our training environment structure. While suggestions to improve training supports were to allow pregnant and parenting trainees more flexibility regarding call scheduling and work hours, it is prudent to consider how non-parenting trainees would be impacted by such changes, and how the structure of our healthcare system could be shifted to maintain high quality care in the face of potential adjustments in the trainee workforce. As many studies have identified similar issues around trainee workload and burnout, further research is needed to address how we can adjust our training system to better support trainees in achieving a more flexible work-life balance.

Finally, the knowledge assessment component of the survey showed that while most trainees had fair knowledge of some fertility concepts, particularly understanding that fertility and IVF success rates decline with age, they had poorer knowledge of others, most notably around the efficacy of oocyte cryopreservation (i.e. egg freezing) with increasing age (Figure 2). Given that over half of trainees reported delayed family initiation, it is key that trainees are well-informed around the implications for such decisions.

Ways to achieve effective knowledge translation requires further study; however, there are existing educational resources designed for Canadian trainees, including the website www.familyplanningfordocs.com, which may be of use to programs aiming to improve knowledge and support for their trainees.[19] A significant knowledge gap identified in this study was that over half of respondents were unaware that residents and some fellows in Ontario have drug coverage through PARO’s insurance plan, including for fertility medications. Without understanding the

implications of age-related fertility decline, and believing that fertility treatment and preservation are financially inaccessible during training, many trainees may be making uninformed choices around family planning.

Condensing the study findings, we have created a list of recommendations for postgraduate training programs to best support trainees in their family planning and fertility goals (Table 5). These recommendations aim to provide guidance to program directors in improving training environments. The list is intentionally not prescriptive, as each program and location will have varying cultures and existing programming.

Table 5. Recommendations to postgraduate training programs to better support trainees in fertility and family planning

Recommendations
Consider ways to provide flexibility to pregnant and parenting trainees around working hours and on-call requirements, taking into account potential impacts on non-parenting trainees.
Provide information to trainees regarding PARO insurance coverage and government funding support for fertility services, and parental leave benefits, explicitly including that many fertility medications are covered.
Assist trainees in finding family physicians, as inaccessibility to primary care is a major barrier to fertility care. Additionally, provide information on alternative routes to receive fertility care, including clinics accepting self-referral, and how to request referral through walk-in clinics.
Encourage sharing of evidence-based resources around age-related fertility decline, infertility care, and fertility preservation to ensure trainees can make informed family-planning decisions, for example through annual multidisciplinary rounds.
Consider developing formal peer-to-peer support networks for those planning to parent or already parenting during training.
Consider developing formal mentorship programs for trainees to have career support around the impacts of parenting during training.

Conclusions

Our study showed that over half of trainees intentionally delay plans to have children due to training, with the most common areas of concern being long working hours and stress. Delayed family initiation was reported more often by women than men, and thematic analysis identified that barriers were often related to gender identity. We also identified a higher infertility rate, similar to other studies of the physician population. Study limitations include volunteer bias, with a greater proportion of cis women represented in our sample than other genders. Areas for program improvement include providing peer support, mentorship, and evidence-based resources to improve knowledge of fertility concepts, treatment and fertility preservation, and information about funding through the Ministry of Health and the benefits available through PARO. Future directions include exploring the reasons for variation seen between disciplines (i.e. surgical versus non-surgical), and expanding this study to other provinces; given that prime reproductive years coincide with medical training, it is crucial to understand how training environments support or pose barriers to trainees in their reproductive planning and seeking of fertility care across Canada.

Conflicts of Interest: There are no conflicts of interest for any of the authors of this manuscript.
Funding: The gift card draw and statistical analysis for this study were funded by a grant from the Department of Obstetrics and Gynaecology at McMaster University.
Acknowledgments: We would like to sincerely thank the postgraduate deans who kindly agreed to disseminate the survey to their trainees, as without their help this study would not have been as successful.
Edited by: Lisa Schwartz (section editor), Christina St-Onge (senior section editor); Marcel D'Eon (editor-in-chief)

References

1. Rangel EL, Castillo-Angeles M, Easter SR, et al. Incidence of infertility and pregnancy complications in US female surgeons. *JAMA Surg*. 2021 Oct 1;156(10):905. https://doi.org/10.1001/jamasurg.2021.3301
2. Katz VL, Miller NH, Bowes WA. Pregnancy complications of physicians. West J Med. 1988 Dec 1;149(6):704–7. https://pmc.ncbi.nlm.nih.gov/articles/PMC1026619/ [Accessed on Oct 1, 2024].
3. Glauser W. Is the culture of medicine contributing to miscarriages among female physicians? *CMAJ*. 2019 Nov 3;191(44):E1229–30. https://doi.org/10.1503/cmaj.1095821
4. Wang A, Herndon CN, Mok-Lin E, Aghajanova L. Infertility, fertility preservation, and access to care during training: a nationwide multispecialty survey of United States residents and fellows. *J Fertility Preserv*. 2021;2:1–10. https://doi.org/10.32371/jfp/246110
5. Anderson M, Goldman RH. Occupational reproductive hazards for female surgeons in the operating room. *JAMA Surg*. 2020 Mar 1;155(3):243. https://doi.org/10.1001/jamasurg.2019.5420
6. Todd AR, Cawthorn TR, Temple-Oberle C. Pregnancy and parenthood remain challenging during surgical residency: a systematic review. *Acad Med*. 2020 Mar 31;95(10):1607–15. https://doi.org/10.1097/ACM.0000000000003351
7. Kudesia R, Chernyak E, McAvey B. Low fertility awareness in United States reproductive-aged women and medical trainees: creation and validation of the Fertility & Infertility Treatment Knowledge Score (FIT-KS). *Fertility & Sterility*. 2017 Oct; 108(4), 711–717. https://doi.org/10.1016/j.fertnstert.2017.07.1158
8. Cavanaugh J. and Neath A. The Akaike information criterion: background, derivation, properties, application, interpretation, and refinements. *WIREs computational statistics* 2019;11(3). https://doi.org/10.1002/wics.1460
9. Erlingsson C, Brysiewicz P. A hands-on guide to doing content analysis. *Afr J Emerg Med.* 2017;7(3):93–9. https://doi.org/10.1016/j.afjem.2017.08.001

10. Canadian Post-MD education registry. *CAPER annual census of post-M.D. trainees.* caper.ca. Available from: https://caper.ca/postgraduate-medical-education/annual-census. [Accessed on Mar 1, 2025].
11. Canadian Medical Association. *CMA national physician health survey: a national snapshot.* 2018 Oct. Available from: https://www.cma.ca/sites/default/files/2018-11/nph-survey-e.pdf. [Accessed on Mar 1, 2025].
12. Kneebone R, Wilkins M. Social policy trends: the average age of mothers at first birth. *The school of public policy publications*. 2024. Available from: https://journalhosting.ucalgary.ca/index.php/sppp/article/view/79060. [Accessed on Nov 22, 2024].
13. Bushnik T, Cook JL, Yuzpe AA, Tough S, Collins J. Estimating the prevalence of infertility in Canada. *Human Reprod*. 2012 Jan 17;27(3):738–46. https://doi.org/10.1093/humrep/der465
14. Van Tuyl, R. Improving access, understanding, and dignity during miscarriage recovery in British Columbia, Canada: A patient-oriented research study. Women's Health. 2024 Jan 1;20. https://doi.org/10.1177/17455057231224180
15. Taylor HS, Fritz MA, Lubna Pal, Emre Seli. *Speroff's clinical gynecologic endocrinology and infertility.* Philadelphia: Wolters Kluwer; 2020.
16. Shalaby R, Oluwasina F, Eboreime E, et al. Burnout among residents: prevalence and predictors of depersonalization, emotional exhaustion and professional unfulfillment among resident doctors in Canada. *Intern J Environ Res Public Health*. 2023 Jan 1;20(4):3677. https://doi.org/10.3390/ijerph20043677
17. Bakkensen JB, Smith KS, Cheung EO, et al. Childbearing, Infertility, and career trajectories among women in medicine. *JAMA Network Open*. 2023 Jul 27;6(7):e2326192. https://doi.org/10.1001/jamanetworkopen.2023.26192
18. Simpson AN, Cusimano MC, Baxter NN. The inconvenience of motherhood during a medical career. *CMAJ.* 2021 Sep 19;193(37):E1465–6. https://doi.org/10.1503/cmaj.211255
19. Family planning for medical trainees. *Starting a family in training.* 2024. Available from: https://www.familyplanningfordocs.com/starting-a-family-in-training. [Accessed on Nov 22, 2024].