

Vasectomy in the absence of paternity

A pre- and post-pandemic Canadian cohort analysis

Gavin Hughes^{1,2}, Ethan Grober³, Tiange Li^{3,4}, Yonah Krakowsky³

¹Temerty Faculty of Medicine, University of Toronto, Toronto, ON, Canada; ²Institute of Biomedical Engineering, University of Toronto, Toronto, ON, Canada; ³Division of Urology, Department of Surgery, University of Toronto, Women's College Hospital & Sinai Health System, Toronto, ON, Canada; ⁴Institute of Medical Sciences, University of Toronto, Toronto, ON, Canada

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ABSTRACT

INTRODUCTION: Vasectomy is a safe and effective method of male sterilization, traditionally conceptualized in practice to be pursued by older, partnered fathers; however, shifting socioeconomic, political, and cultural landscapes may be contributing to changes in the demographic profile of the vasectomized patient. Specifically, this study sought to compare the proportion of men undergoing vasectomy with no prior children between pre- and post-COVID pandemic periods. Secondary outcomes included differences in age, relationship status, and overall vasectomy volume trends.

METHODS: We conducted a retrospective chart review of patients undergoing vasectomy by two high-volume urologists in Toronto, Ontario, from 2018–2024. Patients were divided into two cohorts: pre-pandemic (2018–2019) and post-pandemic (2022–2024). Demographic variables, including age, relationship status, and number of children, were collected and analyzed using multivariable logistic regression to identify whether childlessness was independently associated with the cohort. No vasectomies were performed in 2020–2021 due to COVID-19 restrictions.

RESULTS: A total of 565 patients were included (152 pre-pandemic, 413 post-pandemic). The proportion of men without children rose significantly from 6% to 16% post-pandemic ($p=0.04$). The mean number of children decreased from 2.1 to 1.8 ($p=0.03$). Single men were also significantly more likely to be childless; however, age and relationship status did not differ significantly between groups.

CONCLUSIONS: The demographic profile of vasectomy patients in Canada is evolving. Post-pandemic, more childless men are pursuing sterilization, challenging traditional assumptions about vasectomy candidacy and highlighting broader changes in reproductive decision-making among men.

INTRODUCTION

Vasectomy is a safe and effective method of male contraception, with over 50 million men worldwide having undergone the procedure.¹ As an efficient, elective procedure requiring less than 30 minutes, vasectomy has an excellent success rate, with low reported early failure rate in the range of 0.2–5% and a late failure rate of 0.04–0.08%.² While historically seen as a decision made later in life by partnered fathers of older age and higher income,³ shifts in socioeconomic conditions following the COVID-19 pandemic and politico-legal circumstances in the wake of the 2022 *Roe v. Wade* reversal (*Dobbs v. Jackson*) have suggested the demographic profile of the average vasectomy patient is changing.^{4–6}

Emerging evidence suggests a post-pandemic increase in vasectomy demand,⁷ alongside a concurrent rise in the proportion of men electing for vasectomy without prior paternity.⁸ Furthermore, the rising cost of child-rearing in urban centers, estimated to exceed \$250 000 per child in Canada,⁹ combined with housing unaffordability,¹⁰ wage stagnation, and increasing caregiving demands from aging parents,¹¹ has been implicated in men electing to forgo fatherhood altogether.¹² Additionally, the evolution of gender norms and increasing emphasis on reproductive equity have reframed vasectomy as a responsible and proactive choice for some men, even in the absence of a current partner or children.^{10,13}

Despite these converging trends, there remains a lack of empirical research examining whether

KEY MESSAGES

■ The proportion of Canadian men undergoing vasectomy without prior children increased significantly post-pandemic, from 6% to 16%.

■ These findings challenge the traditional view of vasectomy as a procedure for older, partnered fathers, and highlight its growing role as a tool of reproductive autonomy among men.

■ Clinicians should be aware of the dynamic nature of the vasectomy patient demographic profile with respect to social factors.

Conclusions are limited by sample size, retrospective design, and the inability to ascertain reasons for pursuing vasectomy beyond “not wanting more children.”

the pandemic influenced the demographic profile of vasectomy patients, especially in Canada. Specifically, no study has quantitatively evaluated whether there has been a change in the rate of childless men seeking vasectomy in the post-pandemic era. In this study, we explore changes in the demographics of individuals seeking vasectomy pre- and post-COVID-19 pandemic.

METHODS

A retrospective chart review of patients from two high-volume urologic surgeons located in Toronto, Ontario, from 2018–2023 was analyzed. Due to COVID-19 restrictions, no vasectomies were performed during 2020 and 2021, creating two distinct periods: pre- and post-pandemic. Patients were stratified into two groups: group 1 (pre-pandemic) was composed of patients who underwent vasectomy from 2018–2019 (inclusive); and group 2 (post-pandemic) was composed of patients who underwent vasectomy from 2022–2024 (inclusive). Statistical analysis was completed to compare the two cohorts with respect to patient age, marital/relationship status, and the number of children prior to vasectomy.

The primary study outcome was the frequency of men undergoing vasectomy with no prior children. Secondary outcomes included differences in age, relationship status, and overall vasectomy volume trends across the study period.

Statistical analysis

All analyses were conducted using SPSS (version XX) and R (version XX). Descriptive statistics were calculated to summarize demographic characteristics. Continuous variables, including mean age and number of children, were assessed for normality using the Shapiro-Wilk test. Between-group differences in continuous variables were evaluated using independent samples t-tests for normally distributed data or Mann-Whitney U tests for non-normally distributed data. The primary outcome of interest was childlessness at the time of vasectomy, defined as 0 vs. ≥ 1 child. To examine whether this outcome was independently associated with cohort, we performed a multivariable logistic regression including cohort (pre- vs. post-pandemic), age at vasectomy (continuous), and relationship status (partnered vs single) as predictor variables.

Cohort and relationship status were evaluated for interaction to determine whether the effect of cohort on childlessness differed according to partnership status. Categorical variables, including relationship status (single vs. partnered) and proportion of men with no children, were analyzed using Chi-squared tests of independence. Fisher's exact tests were employed to ensure robustness for comparisons with small expected cell counts. Effect sizes (Cohen's *d* for continuous variables and Cramer's *V* for categorical variables) were calculated to assess the magnitude of observed differences. All statistical tests were two-tailed, and a *p*-value < 0.05 was considered statistically significant.

RESULTS

A total of 565 vasectomy patients were analyzed, including 152 men in group 1 (pre-pandemic) and 413 men in group 2 (post-pandemic).

We conducted descriptive statistics on the baseline population undergoing vasectomy. Figure 1 characterizes the distribution of procedures performed throughout the seven years of the study (2018–2024). Vasectomy frequency is subject to several variables, including fluctuations in both vasectomy demand and clinicians' practices throughout the study period at the study site.

When we stratified by number of children among vasectomy patients by five-year age group, the vast majority (88%) of vasectomies occurred between ages 30 and 49, with peak representation in the 40–44 age group (35.5%) (Figure 2). Half (49.5%) of all vasectomized patients had two children. It is not visualized here, but despite a noticeable skewing towards younger patients in the zero-children group, the statistical result

($p=0.18$) did not exceed our significance threshold to be a univariate predictor.

Table 1 compares the two groups with respect to patient age, relationship status, and the number of children prior to vasectomy.

The percentage of men undergoing vasectomy with no previous children was significantly higher (2.7-fold) among men who completed their vasectomy following the pandemic (6% vs. 16%, $\chi^2=3.9$, $p=0.04$). The mean number of children among men who underwent vasectomy following the pandemic (1.8 children) was significantly lower compared to men completing their vasectomy before the pandemic (2.1 children) ($p=0.03$); however, when the men with no children were removed from the analysis, this result was not significant, indicating the drop in prior children at the time of vasectomy was driven by a changing proportion of childless men.

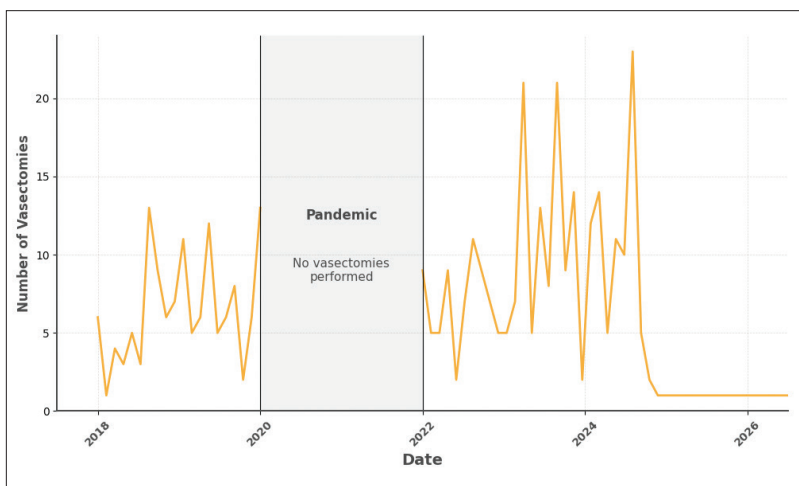


Figure 1. Temporal trends in overall vasectomy frequency (2018–2024), highlighting fluctuations in procedure numbers across the study period.

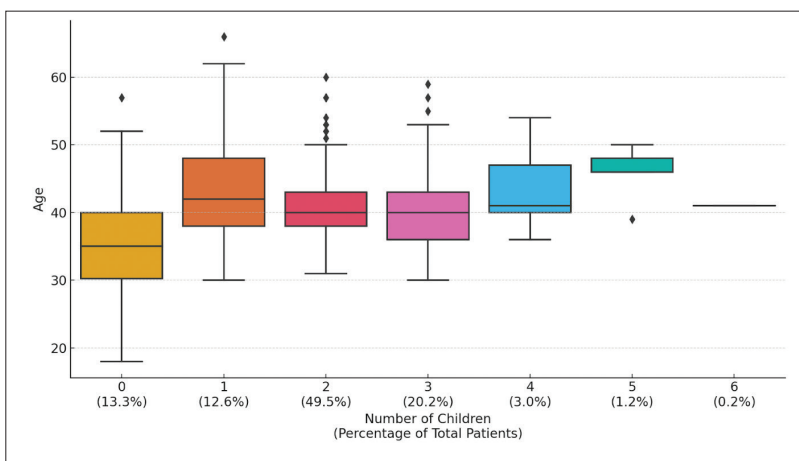


Figure 2. Age distribution of vasectomy patients across all study years stratified by number of children at the time of procedure.

Further, our study cohort was comprised of 5% single men in the pre-pandemic group compared to 9% the post-pandemic group, prompting inquiry into whether there was a true difference in the relationship status of men seeking vasectomy in the post-pandemic period. To evaluate this, we conducted a test of independence comparing the distribution of single vs. married men undergoing vasectomy between the two cohorts. The Chi-squared statistic was 1.06 with 1 degree of freedom, and the resulting p -value was 0.30, indicating no statistically significant association between period (pre- vs. post-pandemic) and relationship status.

On multivariable logistic regression, post-pandemic cohort membership was independently associated with increased odds of undergoing vasectomy without prior children (odds ratio [OR] 2.60 [1.01–6.72], $p=0.047$). Age in years at the time of vasectomy was not associated with childlessness (OR 0.99 [0.95–1.03], $p=0.52$). In contrast, being single was, as expected, a strong independent predictor of childlessness, with single men demonstrating over 12-fold higher odds of undergoing vasectomy without prior children compared to partnered men (OR 12.40 [4.10–37.50], $p<0.001$) (Table 2).

Evaluation of the interaction between cohort and relationship status did not reveal a statistically significant effect ($p=0.65$), meaning the association between cohort and childlessness was consistent across both single and partnered men. In other words, being post-pandemic was associated with increased odds of childlessness, similarly for both groups. The final model demonstrated acceptable fit (Nagelkerke $R^2=0.21$), suggesting the model explains about 21% of the variability in whether patients were childless at vasectomy. While not a large proportion, this is typical in clinical and social science research, where many unmeasured factors contribute.

DISCUSSION

Our study found a statistically significant increase in vasectomies among men without children in 2022–2024 relative to 2018–19. Results also demonstrated that the mean number of children among men who underwent vasectomy following the pandemic (1.8 children) was significantly lower compared to men completing their vasectomy prior to the pandemic (2.1 children). The initial pre-pandemic childless vasectomy rate reported of 6% coincides with other observational studies reporting 4.4% across 1043 men and 4.3% across 4812 men.^{12,14} Both studies also reported that regret among childless patients who undergo vasc-

tomy is very rare, with most associating the procedure with significant life improvements.^{12,14}

Social change is not a new force in shaping vasectomy decision-making, as various studies have illustrated how macro-level factors can impact individual contraceptive decisions.¹⁵ For instance, countries with lower levels of gender inequality tend to have higher rates of vasectomy, suggesting an association between gender equity and expectations on the male to participate in reproductive responsibility.¹⁶ Further, a comparative study analyzing vasectomy data from urban and rural populations in Texas found that men in urban Austin underwent vasectomy at a younger age and with fewer children than their rural counterparts in Temple.¹⁷ Specifically, the mean age at time of vasectomy was 37.41 years in Austin vs. 36.18 years in Temple, and the mean number of children prior to vasectomy was 1.96 in Austin compared to 2.60 in Temple ($p < 0.001$).

Another study found that fathers who were older, more educated, and non-Hispanic white were more likely to undergo vasectomy.¹⁸ Also, men who had at least two children, particularly those with a mixed sex ratio and a smaller age gap between children, were more likely to be satisfied with their family structure and ultimately pursue vasectomy.¹⁸ These patterns support the notion that while vasectomy reflects a sense of reproductive completeness, this perception is intrinsically shaped by social factors.

Isolation period

Our study found a statistically significant increase in vasectomy demand across all men post-pandemic, which can be partially explained by changes in lifestyle and reproductive decision-making during periods of lockdown and social isolation. In the U.S., after an initial reduction in births, 2021 saw a “baby bump” of 5.1% above pre-COVID estimates among U.S.-born mothers.¹⁹ With more time spent at home and fewer external distractions, many couples found themselves with increased opportunities for intimacy, leading to higher rates of conception and childbirth during the pandemic.²⁰ A 2024 study conducted in the military health system reported a 22.1% increase in vasectomy among all men post-pandemic relative to matched-month averages in 2018–2021.⁷ The isolation period presented a window for men to complete their families, as the slower pace of life permitted an undisturbed focus on personal goals that may have been delayed by other commitments pre-pandemic.

Table 1. Independent variables of interest with respect to vasectomy procedure

	Mean age	Relationship status	Mean number of children	Men with no children
Pre-pandemic (2018–2019)	42 years	Single – 5% Partner – 92%	2.1	6%
Post-pandemic (2022–2024)	41 years	Single – 9% Partner – 90% ($p=0.30$)	1.8* ($p=0.03$)	16%* ($p=0.04$)

*Statistically significant difference relative to pre-pandemic < 0.05 .

Table 2. Multivariable logistic regression predicting childlessness at vasectomy

Predictor	Odds ratio (OR)	95% confidence interval	p
Cohort (pre- vs. post-pandemic)	2.60	1.01–6.72	0.047*
Age at vasectomy	0.99	0.95–1.03	0.52
Relationship status (single vs. married)	12.40	4.10–37.50	< 0.001 *
Interaction (cohort * relationship status)	1.30	0.40–4.20	0.65

*Statistical significance at $p < 0.05$.

Economic instability

Vasectomy has been correlated repeatedly with financial security. For instance, rates of vasectomy are positively associated with personal income per capita ($p=0.002$) and the unemployment rate in a given month ($p < 0.001$).¹⁶ Others have found that those of higher education and socioeconomic status were disproportionately represented among vasectomy recipients.²¹ Hence, on an individual level, those of higher income are more likely to pursue vasectomy, while population-wide, scarcity is implicated in vasectomy rate increases.

In the years following the COVID-19 pandemic, Canada has experienced dramatic inflation, increasing housing costs, and stagnating wages, which have made traditional milestones such as child-rearing increasingly inaccessible, particularly for young adults.²² As the cost of child-rearing in urban centers continues to soar, with recent Canadian estimates exceeding \$250 000 per child,⁹ young men are preemptively opting out of parenthood altogether for financial reasons. As released by a 2024 survey, childless adults under the age of 50 who were not planning to have children rose from 37% in 2018 to 47% in 2023.¹²

Additionally, labor market saturation, where advanced degrees no longer guarantee stable employment,²³ further reinforces perceptions of instability. In

this environment, choosing not to have children may no longer reflect a rare lifestyle choice but rather a rational response to an altered social structure.

The demographic reality of an aging population further exerts pressure on fertility-related decisions. In Canada, increasing age and delayed parenthood trends are shifting caregiving responsibilities of working-age adults to be split between young children and aging parents, a phenomenon described as the “sandwich generation” burden.¹¹ In 2022, roughly two million Canadians were reported to be providing care to both children and adults, with the highest prevalence in ages 35–44 (29%).²⁴ Resultingly, the emotional and financial costs of multigenerational caregiving may serve as deterrents to childbearing, especially in the middle-age window (ages 35–44), where vasectomies are most frequently pursued.

In a U.S. study that documented changes in vasectomy uptake among privately insured men, a similar cohort to Canadians under Medicare, the greatest relative change (61% increase) from 2014–2021 was found in those who were childless.⁸ While the absolute rate of vasectomy in childless men remains lower than in those with children, this higher percentage growth reflects that across the study period, those without children viewed vasectomy more favorably, irrespective of procedural payment. Therefore, the cost of the procedure itself was not contributory, at least in privately insured men; however, it is unknown whether their decision hinged on future economic planning.

Vasectomy reversal trends

The uptake in vasectomies may also be partially attributable to improvements in the technical delivery of the procedure and its reversal. The introduction and popularization of the no-scalpel vasectomy technique (NSV), first developed by Li Shunqiang in China in the 1970s, is increasingly performed, with the Canadian Urological Association best practice report first establishing in 2022 that NSV is associated with a significantly lower risk of postoperative complications than conventional vasectomy, and labeling NSV as standard-of-care.^{2,25,26}

Multiple studies have also documented that NSV retains lower operating time, approximately half that of scalpel-based vasectomies.^{2,25}

A 2024 study identified vasectomy trends in France, noting an increase in vasectomy procedures from 3743 in 2015 to 29 890 in 2022.²⁵ A large driver of this increase was thought to be due widespread adoption of NSV, increasing from 313 to 7760 across the seven-year period. While the traditional vasectomy approach maintains

non-statistically different success rates, and complications are rare and minor,²⁶ a large deterrent for men considering the procedure remains the possibility of postoperative pain, bleeding, infection, and prolonged procedures.

Likely more influential for promoting recent (post-pandemic) vasectomy uptake is the changing narrative surrounding the reversibility of the procedure, with a growing number of men approaching it as a potentially changeable decision. The mini-incision microscopic vasovasostomy was introduced in the greater Toronto area in 2008, detailing a no-scalpel method for reversal. The patency rate of the mini-incision procedure retained similar success (96%) to the traditional bilateral incision (91%), and pain severity, as reported by patients, was significantly less in the 48 hours following surgery for those who underwent the single incision method ($p=0.05$).²⁷ Given that vasectomy reversal is a longer, more complicated procedure than vasectomy, a reduction in postoperative complications may influence men to undergo vasectomy if they perceive its reversal as decreasingly burdensome.

There remains the possibility that increasing commercialization of vasectomy reversal, including direct-to-consumer (DTC) advertising, may also have a role in distorting patient expectations.²⁸ A 2021 study found that only 14% of academic providers disclosed the cost of the vasectomy reversal procedure in DTC advertising, and only 1/107 providers shared the full technical details, instead often opting for emotionally appealing imagery.²⁹ Further, private-practice providers were notably more likely to purchase online ads and display packages often for promoting vasectomy reversal up front.²⁹

DTC is well-established as a driving force for patient-initiated requests for treatments, even when clinically inappropriate, by shaping beliefs about safety and efficacy.³⁰ One U.S. survey found that in the U.S., 56% of patient-initiated discussions based on DTC ads were for specific interventions,²⁹ however, while no post-pandemic analysis has quantified vasostomy prevalence or the role of reversal expectations on vasectomy decision-making, an observational study from 2004–2014 found vasectomy reversal rates declined by 81.2%.³¹

For those who do seek reversal, motivations tend to center around relational factors, with the most common reason cited, unsurprisingly, as a joint desire for children, typically with a new partner;³² however, a single-institution study found that none of the men who were childless at the time of vasectomy sought consultation for fertility restoration.³³ This suggests that while reversibility may be influential in shaping perceptions, actual reversal behavior among childless men remains limited.

Gender role switch

The evolving dynamics of gender roles and reproductive decision-making warrant consideration, as increasingly, male sterilization is being discussed within the discourse of gender equity.³⁴ Ethnographic interviews of men in Costa Rica revealed that vasectomy is viewed as an act of responsible masculinity, a mechanism of supporting deeper reproductive equity within relationships.¹³ Higher vasectomy rates have been documented to follow socio-economic development and equity, as evidenced by Australia, Denmark, the U.K., New Zealand, and Switzerland.³⁵ Conversely, countries have elected to ban or severely restrict vasectomy, including Iran, whose parliament voted to ban permanent contraception methods in 2014 with the intent to boost population growth.³⁶ Human rights observers have described this decision as a patriarchal policy that reinforces women's roles as "baby-making machines."³⁷ Correspondingly, Iran ranks near the bottom in global gender parity metrics, with other restrictive laws limiting women's economic participation, legal rights, and bodily autonomy.³⁸

Simultaneously, traditional relational structures, such as marriage, are on the decline, with Canadian marriage rates falling by 20% from 2000–2020.³⁹ In parallel, dating culture has shifted toward casual or short-term relationships, particularly among Millennials and Generation Z cohorts, where long-term family planning may not align with prevailing lifestyle values.¹⁸ In these contexts, permanent contraception may reflect a prioritization of autonomy rather than partnership.

The most widely used contraceptives across both sexes remain the combined oral contraceptives (COCs) due to their high efficacy, accessibility, rapid reversibility, and lack of invasiveness.⁴⁰ An established risk of COCs, however, is increased risk of venous thromboembolism, including deep vein thrombosis and catastrophic pulmonary embolism. The relative risk of VTE is approximately three- to five-fold higher in COC users compared to non-users.⁴¹ Likewise, COVID-19 patients have been reported to be at a greater risk of venous thromboembolism, and a systematic review in *BMJ Sexual & Reproductive Health* noted that those with COVID-19 also using hormonal contraception could be at additional risk.⁴¹

Furthermore, substantial vaccine hesitancy is reported to be directly linked to misinformation surrounding the increased risk of clotting as a vaccine-related complication.⁴² Despite this, a survey study with 1 357 women identified no pandemic-related changes in initiating contraception, and found statistically significant reductions in

ceasing contraception within demographic subgroups.⁴³ Furthermore, intrauterine devices, oral contraceptives, and emergency contraception are now included under the Canadian Pharmacare Act,⁴⁴ incentivizing those who once could not afford these out-of-pocket options to access effective contraception free of charge.

Dobbs v. Jackson

The Canadian legal landscape remains largely supportive of reproductive rights; however, the U.S. Supreme Court's June 24, 2022, decision to overturn *Roe v. Wade*, eliminating the federal constitutional right to abortion in the U.S., may have influenced the attitudes of Canadian men toward reproductive autonomy. A single Michigan health system identified a 225% increase in new vasectomy consults following the decision, as compared to a similar time frame in the year prior.⁴ The study also found that partnerless and childless men were less likely than married men to seek consultation following the decision.⁴ Another study exploring the role of *Dobbs v. Jackson* found similar results, reporting 16.9% of post-*Dobbs* men were childless, compared to 8.6% of pre-*Dobbs* men ($p=0.05$).⁶

An indication of vasectomy interest is further described by an observational study comparing Google searches across 2017 and 2022. Results indicated that "vasectomy" searches peaked on June 25, 2022, with the highest search rate in the five years of the study, a four-fold elevation over average rates during the study period.⁵ Across a database of more than 87 million in the seven months following the *Roe v. Wade* overturning, 0.233% of U.S. vasectomy-naïve men undergoing any outpatient clinical evaluation underwent vasectomy, a 20% bump relative to the seven months prior.⁴⁵

Survey data suggest that political changes abroad can shape domestic behaviors, especially in culturally adjacent countries like the U.S. and Canada.⁴⁶ Given that our study's data collection period coincides with this monumental court ruling, it is difficult to isolate the effects of the pandemic from this political reality. Regardless, trends in the U.S. may indicate that vasectomy is increasingly viewed through a lens of reproductive agency rather than solely as a mechanism for family planning.

Limitations

This study has several limitations, namely its observational nature, which precludes the ability to establish causality. Furthermore, although we conducted a multivariable logistic regression to assess whether childlessness at the time of vasectomy was independently

associated with cohort, we were unable to incorporate a broader range of covariates, such as socioeconomic, cultural, and political factors. As a result, residual confounding is likely, and the findings should be interpreted with caution.

In addition, as a single-center cohort, findings may not be generalizable to broader practice settings. There also exists a disparity in cohort sizes, with significantly fewer patients in the pre-pandemic group relative to the post-pandemic group. This imbalance may introduce bias by magnifying apparent differences between groups. Furthermore, we did not ascertain the reasons for vasectomy beyond “not wanting more children” from patients.

Clinical implications

It may be helpful for clinicians to re-examine their approach to pre-vasectomy counseling in light of the evolving demographic characteristics of patients. Whereas vasectomy has historically been regarded as a procedure pursued predominantly by older, partnered fathers, our findings demonstrate that an increasing proportion of childless men are electing sterilization. This shift underscores the importance of counseling frameworks that move beyond traditional assumptions and incorporate explicit discussions regarding the permanence of vasectomy, the potential for decisional regret, and the limited role of reversibility. Although regret appears to be infrequent in existing literature, ensuring that patients fully appreciate the long-term implications of their choice remains a critical element of care.

Further, it may be valuable for clinicians to situate these individual decisions within broader sociocultural and economic contexts, such as rising housing costs, delayed patterns of family formation, and evolving gender norms that are increasingly relevant to reproductive planning. By embedding these considerations into patient-centered counseling, practitioners may be better equipped to facilitate informed decision-making across a more heterogeneous patient population and to adapt clinical practice in ways that reflect contemporary expressions of reproductive autonomy and responsibility.

CONCLUSIONS

Following the global pandemic, more childless men are choosing to pursue vasectomy, indicating a shifting demographic profile of vasectomy patients in Canada. The observed pattern corresponds with broader societal trends, including cost-of-living challenges, evolving gender norms, and changing relationship structures.

These findings add to the growing literature that challenges traditional assumptions about male sterilization being limited to older, partnered fathers and highlight the growing role of vasectomy as a vehicle for individual reproductive agency. Future research should explore the long-term implications of these trends, particularly with respect to motivations for sterilization and perceptions of reversibility.

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CORRESPONDENCE: Mr. Gavin Hughes, Temerty Faculty of Medicine, University of Toronto, Toronto, ON, Canada; gavin.hughes@mail.utoronto.ca