Canadian Gastroenterology Career Pathway Experiences: Exploring the Gender Divide

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Abstract

Background: We aimed to determine the persistence of differential career experiences between male and female gastroenterologists in Canada >20 years after they were first noted in the literature.

Methods: A 51-question mixed-methods survey was developed focusing on personal, professional and financial characteristics. The survey was disseminated via email and fax to practicing gastroenterologists using provincial college registries and the Canadian Association of Gastroenterology. Numerical data were analyzed using the chi-square test. Qualitative thematic analysis was conducted for short answer responses.

Findings: There were a total of 114 responses (17% response rate) with 35% female respondents. Mean age was 49 years for males and 41 years for females (P = 0.001). Clinical practice types included general GI (63%), urban (82%) and academic (51%). Males reported more endoscopy time (P = 0.001) versus females who spent more time on research (P < 0.001). Men were more likely to be married (P = 0.011), but women were more likely to be responsible for childcare (P = 0.016). Women were more likely to choose between marriage and career and more chose marriage compared to men (P = 0.045). Males earned >$100,000/year higher income than females even when offset by age and work hours (P = 0.048). A salary >$600,000 was reported by 32% of men, compared to 3% of women. Female gastroenterologists reported less mentorship during GI training, challenging relationships with support staff, reduced promotion opportunity, more difficulty publishing and having their competency challenged.

Interpretation: Compared to previous data, there has not been significant gender-related progress in the past two decades regarding female gastroenterologists’ clinical practices, remuneration and work-life balance.

Keywords: Canadian, Diversity and Inclusion, Equity, Gastroenterology; Gender

INTRODUCTION

In the Canadian Medical Association 2019 census, Canada had a total of 829 practicing gastroenterologists of which 259 (31.2%) were female (1). This gender disparity within gastroenterology is present in other countries including the United States where 17.6% (2593/14728) of gastroenterologists are female (2).

The impact of physician gender imbalance is not fully understood. Varadarajulu et al. demonstrated that female patients expressed a gender preference even if it meant a longer wait time for their procedure compared to male patients (45% vs. 4.3%) (3). Female patients specifically from lower income levels and those with a history of physical/emotional abuse showed a gender preference for an endoscopist (4). Studies have found the main reason behind wanting a female endoscopist is due to embarrassment (5–6). Having more female endoscopists to accommodate patient preference may be important in attaining higher patient satisfaction.

An American Gastroenterology Association survey found that significantly more female gastroenterologists reported that gender affected their career advancement than men (47% vs. 9%) (7). Academic female gastroenterologists reported less overall career satisfaction and promotion compared to their male colleagues. A prospective cohort study completed over 10 years found significant differences in remuneration between male and female gastroenterologists (8). Women earned on average $82,000 (22%) less per year than men even after adjusting for practice setting, work hours, endoscopy hours and vacation time. More women practiced in an academic setting (38% vs. 17%) but were less likely to hold advanced academic positions. Such studies show that gender differences are pervasive throughout the gastroenterology field.

In Canada, two surveys administered by the Canadian Association of Gastroenterology (CAG) in 1994 and 2014 showed that gender-based challenges exist (9, 10). Heathcote et al.’s landmark study focused on gender disparity among gastroenterologists to understand barriers for females (9).
Results from this paper included female gastroenterologists earning significantly less, being the main caregiver responsible for childcare and experiencing greater difficulty in attaining academic goals compared to their male colleagues. The main conclusion was that professional success and satisfaction were attainable by female gastroenterologists, but it required greater personal sacrifice compared to males. Similar themes noted by Perera et al.’s more recent survey included female gastroenterologists encountering difficulty with career advancement, achieving work-life balance and a lack of mentorship (10).

The aim of this study was to determine the persistence of differential career experiences between male and female gastroenterologists in Canada more than two decades after they were first noted by Heathcote et al.

**METHODOLOGY**

A 51-question mixed-methods survey was developed using Heathcote et al.’s study and a review of relevant literature (9). The survey focused on personal, financial and professional characteristics of Canadian gastroenterologists, specifically, academic versus community practice differences, family dynamics including childcare, remuneration, mentorship during training, leadership roles and workplace relationships. To effectively compare with the results of the original 1994 survey, we attempted to preserve the original themes explored but also incorporate more recent issues identified in the literature. Our survey closely mirrored Heathcote et al.’s with majority multiple choice questions with expanded answer options, as well as a greater number of qualitative questions. As the new survey was intentionally kept similar to Heathcote’s original in order to facilitate comparisons over time, no formal pilot was conducted.

A cross-sectional sampling strategy was performed with all ten Canadian provincial College of Physicians and Surgeons websites used to identify practicing gastroenterologists in 2019 to 2020. No physician databases were available for the Canadian territories. The survey was faxed and emailed in June 2019. CAG included the survey link in their September 2019 and March 2020 membership emails. Consent was considered implicit with completion of the survey. No identifying information was requested regarding respondents or specific centers.

Chi-Square Test or Wilcoxon Rank-Sum Test was used to assess for statistical significance ($P$-value of <0.05). Qualitative thematic analysis was applied for short answer responses (11). This included familiarization of the qualitative responses to create a thematic framework. Two research team members completed the analysis individually and compared results ensuring agreement. Any discrepancies were decided upon by group consensus. These methods allowed for thematic saturation to be achieved. The primary predictor variable in these analyses was gender.

This initiative was formally reviewed by the research ethics board at Women’s College Hospital, University of Toronto and was deemed not to require Research Ethics Board approval.

**RESULTS**

**Demographic Characteristics**

A total of 114 gastroenterologists responded (17% response rate) with 35% females. The median age of males was significantly older than females (49 ± 10.6 vs. 41 ± 8.5 years, $P = 0.001$). The mean year of graduation from gastroenterology residency for males was 2001 (±10.3 years) and for females was 2008 (±5.1 years). An equal number of males and females had acquired additional post-graduate education including Masters and PhD degrees (43%). Men were significantly more likely to have been practicing longer than women ($P = 0.001$) with 31% of males practicing for greater than 20 years compared to 3% of females (Table 1).

**Practice Characteristics**

More than half (54%) practiced in Ontario, but female gastroenterologists were significantly more likely to be located in the western provinces of Alberta (25%) and British Columbia (10%) ($P = 0.04$). The majority of respondents practiced in an urban setting (82%), as general gastroenterologists (63%), in academia (51%) with no significant difference between

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**Table 1. Demographic characteristics of respondents**

|                        | Men          | Women        |
|------------------------|--------------|--------------|
| No. of respondents (%) | 74 (65%)     | 40 (35%)     |
| Age (yr, mean± SD)     | 49 ± 10.6    | 41 ± 8.5*    |
| Year of Medical School Graduation (mean ± SD) | 1995 ± 10.7 | 2002 ± 5.0  |
| Year of GI Graduation (mean ± SD) | 2001 ± 10.3 | 2008 ± 5.1  |
| No. with additional Post-Secondary Degree (%) | 32 (43)      | 17 (43)     |
| No. married/in a relationship (%) | 71 (96)     | 32 (80)†    |
| No. with children      | 62 (86)      | 30 (78)      |
| Age having first child (mean ± SD) | 31 ± 5.7   | 29 ± 7.6    |
| No. where spouse was main caregiver (%) | 35 (47)      | 2 (5)‡       |
| Income Range (mean)    | $400,001–$500,000 | $300,001–$400,000$ |
| Expected Retirement Age (yr, mean± SD) | 63 ± 8.4     | 57 ± 9.3    |

*P = 0.001.
†P = 0.011.
‡P < 0.001.
§P = 0.001.
genders. The majority of respondents had adult-only patient populations (86%). Men worked a significantly higher average number of hours per week compared to women (54 ± 10.9 vs. 48 ± 12.3 h, \( P < 0.001 \)). Men were significantly more likely to have a greater proportion of their practice dedicated to endoscopy than women (41% vs. 33%, \( P = 0.001 \)). There were significantly more men practicing as therapeutic endoscopists than women (42% vs. 0%, \( P < 0.001 \)). Women were significantly more likely to incorporate research into their practice (31% vs. 5%, \( P < 0.001; \) Table 2). Similar numbers of males and females stated being actively recruited for jobs (45% vs. 46%). The mean expected retirement age did not differ significantly between males and females (63 ± 8.4 vs. 57 ± 9.3 years).

Family Characteristics
Males were significantly more likely to be married or in a relationship compared to females (96% vs. 80%, \( P = 0.01 \)). Overall, 29% of respondents were married to another physician. More women reported having to choose between their marriage and career (26% vs. 15%) and more women chose marriage compared to men, who all chose career (60% vs. 100%, \( P = 0.03 \)). Qualitative thematic analysis from 45 comments (males = 29, females = 16) showed that respondents felt a supportive spouse was required to have balance between marriage and career.

The majority had children (78%) with no significant difference between men and women (86% vs. 78%). The mean age at which their first child was born was similar (males 31 ± 5.7 years vs. females 29 ± 7.6 years). Men were significantly more likely to leave the majority of caregiving to their spouse (47% vs. 5%, \( P < 0.001 \)). Women were significantly more likely to share childcare responsibility with their spouse (45% vs. 33%, \( P = 0.016 \)) and to hire outside help for childcare (41% vs. 7%, \( P < 0.001 \)). More women reported having to choose between family and career compared to their male colleagues (41% vs. 17%, \( P = 0.045 \)). Analysis from 49 comments (males = 26, females = 23) revealed that most felt spousal support was necessary to balance career and children. Maternity leave and taking time off work to prioritize childcare were felt to impact career negatively.

Remuneration
The average annual personal income reported was significantly different between male and female gastroenterologists ($400,000–$500,000 vs. $300,000–$400,000, \( P = 0.048 \)). When matched by the significant age difference in a multivariable regression analysis, men still made significantly higher annual income than women (\( P = 0.005 \)). Furthermore, when matched by part-time versus full-time hours, the difference between annual salary remained significant (\( P = 0.046 \)). The higher income brackets showed 32% of males reporting a salary over $600,000 compared to 3% of females (Figure 1). Women were significantly more likely to believe their salary did not match their earning potential than men (68% vs. 36%, \( P = 0.01 \)). Females felt that their institution (48% vs. 30%, \( P = 0.04 \)) and the job market (23% vs. 7%, \( P = 0.01 \)) were the main reasons for this discrepancy in earning potential. Almost a third (30.7%) of respondents experienced job insecurity, specifically 27% of males and 43% of females. Qualitative analysis of 32 comments (males = 23, females = 9) reflected anxiety regarding government cuts to endoscopy time and a lack of full-time positions.

Medical Training
The majority of respondents had male and female mentors (69% vs. 56%) during general internal medicine residency. During gastroenterology residency, men were significantly more likely to have both male and female mentors, compared to women who were more likely to have only male mentors (61% vs. 41%, \( P = 0.03 \)). Female-only mentors in gastroenterology were rare with 1% of males and 5% of females reporting this variant (Table 3). Women were more likely to have no mentors in GI training than men (13% vs. 2%) and of those females without mentors, 80% did not further specialize within gastroenterology (\( P < 0.001 \)).

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**Table 2. Practice characteristics of respondents**

| Breakdown of sub-specialty | Men | Women |
|---------------------------|-----|-------|
| Dietetics (%)             | 2   | 2     |
| Gastroenterology (%)      | 25  | 24    |
| Gastrointestinal Surgery (%) | 41  | 33    |
| Inflammatory Bowel Disease (%) | 8   | 10    |
| Hepatology (%)            | 10  | 11    |
| Other (%)                 | 5   | 8     |
| Endoscopy %               | 41  | 33†   |
| Research %                | 10  | 21§   |
| Administrative %          | 13  | 12    |
| Other %                   | 9   | 14    |

\( ^{\dagger} P = 0.027 \)

\( ^{\ddagger} P < 0.001 \)

\( ^{\ast} P = 0.001 \)

\( ^{\ast} P < 0.001 \)

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**Figure 1. Personal annual income of Canadian gastroenterologists by gender (CDN).**
During GI training, more women felt they had different expectations placed on them due to intrinsic factors such as gender than males (42% vs. 30%). Females reported more difficulty in achieving success compared to their male counterparts (34% vs. 11%, $P = 0.005$). Women were significantly more likely to have their medical training interrupted compared to men (32% vs. 9%, $P = 0.002$). Parenting responsibilities were the most common reason for interruption (25.7%) including maternity leave. When controlling for having children, less women sub-specialized within gastroenterology compared to their men ($P < 0.001$).

**Staff Gastroenterology Career Characteristics**

More men than women achieved full professor status (17% vs. 6%). The majority of respondents (79%) described difficulty managing work-life balance, but women were disproportionately affected (89% vs. 69%, $P = 0.021$). Several reasons were provided for this difficulty including on-call scheduling, coordinating with spouse or childcare, making time for social activities, meetings or oneself. Significantly more women than men stated coordinating childcare was an obstacle to juggling career and private life (60% vs. 32%, $P = 0.004$; Table 4). Although the minority of respondents faced work-related challenges, women were affected more than men. More women than men reported a lack of recognition at work (48% vs. 31%). Qualitative analysis of 21 comments (males = 13, females = 8) found a lack of support in the actualization of ideas or others taking credit, especially senior and male colleagues. Women were significantly more likely to report reduced opportunity for promotion compared to men (40% vs. 12%, $P = 0.001$). The most common reason across 20 comments (males = 8, females = 12) was gender bias. Women were significantly more likely to experience difficulty in achieving success compared to their male counterparts (33% vs. 7%, $P = 0.001$) due to perceived gender-based bias. Female gastroenterologists felt less respected (being called by their first names rather than “doctor”) and were perceived as more demanding compared to their male colleagues (Table 5).

**DISCUSSION**

Despite the intervening 20 years since Heathcote et al.’s survey, female representation among Canadian gastroenterologists continues to be disproportionately low and gender disparities exist in personal, professional and practice spheres. (9) The primary predictive factor of interest in this study is gender. All data analyses were performed with the objective of assessing for gender differences in study outcomes, similar to Heathcote’s study previously. We attempted to provide both quantitative and qualitative data for gender-related outcome differences wherever possible based on the data collected.

**GI Training and Mentorship**

This study showed that gender-based disparities started during gastroenterology residency, with females experiencing a more difficult path towards personal success. These findings are in agreement with the existing literature. Fnais et al. showed in a meta-analysis of 51 studies, high rates of female gender discrimination (53.6%) experienced during medical training (12). Dayal et al. examined resident evaluations finding that female emergency medicine trainees lagged behind their male colleagues, potentially due to evaluator implicit gender bias (13). Their study showed that scores at the start of training

| Mentors | General Internal Medicine | Gastroenterology |
|---------|---------------------------|------------------|
|         | Women % ($n = 39$)        | Men % ($n = 74$) |
|         |                           | Women % ($n = 39$) | Men % ($n = 72$) |
| Male only | 12.8                      | 18.9             |
| Female only | 2.5                      | 0                |
| Both     | 56.4                      | 68.9             |
| None     | 28.2                      | 12.1             |

Table 3. Mentors during GIM and GI training

| Barriers to achieving work-life balance | Women % ($n = 40$) | Men % ($n = 74$) |
|----------------------------------------|--------------------|------------------|
| Personal Interests                     | 88.9               | 68.5             |
| On-Call Scheduling                     | 51.2               | 50               |
| Coordinating with Spouse              | 60                 | 43.2             |
| Coordinating with Childcare           | 60                 | 32.4             |
| Coordinating with Routine             | 47.5               | 36.4             |
| Time for Social Activities            | 65                 | 59.4             |
| Time to Attend Meetings               | 47.5               | 39.1             |
| Time for oneself                      | 35                 | 36.4             |
| Time for CME                          | 62.5               | 63.5             |

Table 4. Barriers to achieving work-life balance

$P = 0.004$. 6%, $P < 0.001$ due to perceived gender-based bias. Lastly, women were significantly more likely to experience a challenging relationship with administrative staff (33% vs. 7%, $P = 0.001$) due to perceived gender-based bias. Female gastroenterologists felt less respected (being called by their first names rather than “doctor”) and were perceived as more demanding compared to their male colleagues (Table 5).
were similar but females uniformly performed below males by the end of residency which made universal diminished clinical performance less likely to be the cause. Gender-based disparities in other areas of training such as less mentorship, less opportunities to practice clinical skills, less meaningful feedback received and social determinants such as taking maternity leave may play a role. Kolehmainen et al. noted that female trainees reported an added stress in needing to deviate from gender behavioral norms, specifically when taking on the role of a leader (14).

Mentorship has been shown to be an important predictor of career satisfaction especially for female gastroenterologists (15). The majority of respondents in our study had mentors during their training, but women had fewer mentors overall and there was a paucity of female mentors which is in agreement to what Heathcote et. al. noted in their study (9). The presence of mentorship during gastroenterology residency had a significant impact on whether female trainees further subspecialized. The original Heathcote and Perera papers did not explore types of mentorship programs in existence and whether informal versus formal strategy is better. The presence of more female role models during gastroenterology residency and early career could be instrumental in offsetting implicit gender bias and modeling alternative gender normative behaviors during this critical period.

Family Responsibilities and Work-Life Balance

Work-life balance issues were centered around career sacrifice due to domestic responsibilities. Women experienced having to choose between their careers and marriage or children significantly more than men. This pattern is seen in the literature as female physicians have been shown to spend a greater number of hours on household and childcare responsibilities compared to male physicians (16, 17). Our study had 29% of respondents in dual-doctor marriages, and even in this situation, gender imbalance in domestic activities has been demonstrated where physician husbands are less likely to consider domestic factors in choosing their specialties and their career development taking priority over their wives’ careers (18). Our study showed further significant detriment to female gastroenterology careers in the lower rates of sub-specialization by women with children. Understandably, spousal support was cited as being paramount to balancing career and family. Unfortunately, the challenges faced by female gastroenterologists in choosing between career and family responsibilities have not greatly changed since Heathcote explored this 20 years ago. There is much room for improvement in terms of support from employers and national gastroenterology groups.

Remuneration

Our study showed a significant difference of >$100,000 annual self-reported income between male and female gastroenterologists even when matched by age and work hours. This is an important consideration as more females worked part-time, but this was not the reason for their lower income. We did not quantify work hours specifically; however, it is important to note that the group who worked part-time was very small, so this should not be a significant confounding factor (n = 4 with 3 females and majority working <10 years).

Men were significantly older than women in this study with >70% of males having worked 10+ years compared to 70% of women having worked <10 years. Despite this difference, in almost every year-in-practice category, women made approximately $100,000 less despite the average age being comparable. Furthermore, our study showed that the upper brackets of income (>-$600,000) had more males than females especially when compared with Heathcote et. al. and Perera et. al. who had majority of respondents earning <$200,000/year (9, 10). This could be explained by 20 years of inflation and a large proportion of non-physician respondents, respectively. Our results showed that concerns about earning potential and job insecurity were more common among female respondents. Perhaps unique to the funding model of healthcare in Canada, the respondents’ concerns centered on government budget cuts, minimal endoscopy time and lack of full-time positions.

Gastroenterology Career Barriers

A higher percentage of male gastroenterologists in the United States have been shown to hold leadership positions such as program director and division head compared to women (19). The female respondents in our study similarly struggled more than their male counterparts to be recognized for their

| Major themes | Respondent quotes |
|--------------|------------------|
| Difficult relationships with Senior Colleagues | Most are supportive. Not being invited to events with senior colleagues outside of work. Senior colleagues exhibit gender and age-based bias. |
| Difficult relationships with Support Staff | Gender and age-based bias leading to difference in treatment and respect. |
| Difficult relationships with Administrative Staff | Gender-based bias with differences in expectations. |

Table 5. Qualitative themes in difficult relationships at work
contributions and be afforded opportunities for promotion. There are examples of this in the Canadian literature such as Buell et. al. showing that on average, even in a large academic center, only 17% of invited grand round speakers were female (20). These data suggest that promotion practices and the mechanisms for selecting conference chairs, speakers etc., need to be more transparent in order to ensure a merit-based system.

Publishing research and receiving research grants are often used as important measures of academic productivity when considering a candidate for promotion. Raj et. al. showed that women in academia have a lower rate of publication compared to men even after adjusting for specialty and duration of career (21). At more visible authorship positions such as on clinical practice guidelines, female physicians had only a 25% showing (22). Similarly, the gastroenterology literature shows that female physicians are increasing their presence as first authors but still lag behind their male colleagues as senior authors (23). Although we did not explore publishing achievements in our study, difficulty publishing as first author and receiving research grants was significantly more likely among females. This again highlights the importance of providing equitable resources and opportunities to female gastroenterologists.

Work-Place Relationships During GI Staff Career
Female respondents disproportionately reported having challenging relationships with their senior colleagues, administrative and support staff. This has not changed since Heathcote first described it. More recent literature shows that female physicians have experienced being questioned more by their nursing colleagues compared to male physicians (24). The majority of support staff were female which was felt to create hierarchical clashes with displays of disrespect and inappropriate frankness. Microaggressions were mentioned in many forms in our qualitative results including not being addressed as “doctor” when the physician is female. Files et. al. also showed that female speakers at grand rounds were introduced without their professional titles 50.8% of the time (25).

Limitations
The main limitation of this study is the low response rate (17%). Every effort was made to include a wide sample of Canadian gastroenterologists by using provincial College of Physicians and Surgeons membership rather than CAG membership alone. This methodology also allowed for the capture of only practicing gastroenterologists rather than related positions such as nurses and researchers. Multiple methods of dissemination and multiple attempts at recruitment were also made in an effort to maximize response rate. The male/female dichotomy used in this study is social constructs which may limit the results to those who identify with these categories only. Although we did broaden the scope of issues examined compared to previous similar studies, there are further areas that could be explored: motivations in pursuing gastroenterology training, types of mentorship programs (formal vs. informal) that exist and how they compare, focus on research-stream gastroenterologists (i.e., information on grants awards) and examining groups other than those in heteronormative relationships. Finally, in our qualitative results, including perspectives of non-physician colleagues such as endoscopy nurses would help us to better understand their dynamic with gastroenterologists.

CONCLUSION
There have only been two studies to date regarding gender equity and diversity issues among Canadian gastroenterologists (9, 10). This study broadens and expands previously explored issues of family status, income, medical training experiences, career development and academic pursuits. Our findings point to continued gender-based differences in the experiences of gastroenterologists, despite slow improvements in female representation.

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Authors’ contributions
Dr. Noor Jawaid contributed to the planning and conduction of the study, interpretation of data and drafting of the manuscript. She has approved the final draft submitted. Monica Boctor contributed to the conduction of the study, collection and interpretation of data. She has approved the final draft submitted. Jordan LoMonaco contributed to the analysis and interpretation of data for the study. She has approved the final draft submitted. Dr. Natasha Bollegala contributed to the planning and conduction of the study, interpretation of the data and critical revisions of the manuscript for important intellectual content. She has approved the final draft submitted. Guarantor of the article: Dr. Natasha Bollegala.

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