Mind the gap: perceptions and experiences of a gender gap at a Canadian research institute and potential strategies to mitigate this gap, a mixed methods study.

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Abstract

Background: The gender gap in academia is longstanding. Failure to ensure our academic faculty reflect our student pool and national population deprives Canada of talent. We explored gender distribution and perceptions of the gender gap at a Canadian university-affiliated research institute.

Methods: We completed a sequential mixed methods study. In Phase 1, we used the research institute's registry of scientists (1999-2014) and estimated overall prevalence of a gender gap and the gap with respect to job description (e.g., associate versus full time) and research discipline. In Phase 2, we conducted qualitative interviews to provide context for Phase 1 data. Both purposive and snowball sampling were used for recruitment.

Results: The institute included 30.1% (N=62) women and 69.9% (N=144) men, indicating a 39.8% gender gap. The majority of full-time scientists (60.3%, N=70) were clinicians and the gap was largest in this group; there were 54.2% more men than women clinician scientists. Ninety-five percent of basic scientists were men, indicating a 90.5% gap. Seven key themes emerged from 21 interviews including perceived impact of the gender gap, factors perceived to influence the gap, recruitment trends, presence of institutional support, mentorship, and suggestions to mitigate the gap. Several factors were postulated to contribute to the gender gap including unconscious bias in hiring.

Interpretation: A substantial gender gap exists within this research institute. Participants identified strategies to address this gap such as establishing transparent search processes, providing opportunities for informal networking and mentorship of women scientists, and establishing institutional support for work-life balance.

Key words: academic careers; gender gap; gender bias; mentorship

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Introduction

At both the undergraduate and graduate student levels, women have outnumbered men in Canadian universities for more than 20 years.(1) However, a similar demographic is not reflected in more senior levels of academia; specifically, the higher the university rank, the lower the proportion of women compared with men.(1) This disparity is also evident in research grant funding with recent data from the Canadian Institutes of Health Research showing that women aged less than 45 years were less likely to receive grant funding than their male counterparts.(2) And, in April 2016, the Canada Research Chair's Steering Committee sent an open letter to the Canadian University Presidents calling on institutions to strengthen their efforts to address underrepresentation of women within the program, noting that over the past 15 years, the percentage of female Tier 1 chair holders has remained unchanged at 17%.(3)

In 2012, the Canadian Council of Academies reviewed what factors may influence the career trajectory of female researchers and underlie the gender disparity observed in Canadian universities.(1) This Panel was limited in its ability to address this challenge because of the paucity of data. They outlined that institutional policies can influence the career trajectory of women researchers and highlighted the critical need to know what is happening at Canadian universities to better understand the reasons for the disparity and to develop and implement solutions.(1) Failure to ensure that our faculty reflect our student pool and indeed, our national population, deprives our country of a talented pool of individuals who could enhance innovation and advance our competitiveness internationally. To meet this challenge, we wanted to explore gender distribution at a university-affiliated research institute and explore the perceptions and experiences of the gender gap. We are intending to use this information to develop, implement and evaluate strategies to address the gap.

Methods

We completed a sequential mixed methods study to explore the presence of a gender gap at a Canadian university-affiliated research institute, the perceptions and experiences of scientists related to this gap, and potential strategies to address this gap. This study was completed at St. Michael's Hospital (SMH), which is fully affiliated with the University of Toronto in Toronto, Canada. The SMH research institute was established in 1999; it includes the Keenan Research Centre that focuses on basic and translational research and the Li Ka Shing Knowledge Institute that focuses on clinical and health services research.

Phase 1

Data Source

We accessed the registry of scientists appointed to the SMH research institute. This registry is maintained by the SMH Office of Research Administration and included all scientists appointed from 1999 to December 2014. The registry also included scientists who left the institution during this period. Data were available on the year of the scientist's initial appointment to the research institute, the individual's academic appointment, gender (male/female/other), job description and research discipline. All SMH scientists must have an academic appointment with the University of Toronto within 1 year of their appointment. The academic appointment may be as a lecturer, assistant professor, associate professor or full professor. Job descriptions are categorised as a clinician scientist (the individual also has a clinical appointment), an employee scientist (an individual with a PhD who is not a clinician), and associate scientist (an individual who may be appointed elsewhere or may be a part-time researcher at SMH). Research discipline was categorised as basic research, clinical research (includes health services research) or both.

Analysis

We estimated the overall prevalence of a gender gap among scientists at the research institute and investigated the gap with respect to associate versus full time scientists, clinician versus employee scientists, as well as to research discipline (basic vs. clinical, or both). Data on university appointments for scientists were considered to examine gender distribution in academic rankings (lecturer, assistant professor, associate professor and full professor). We also investigated the trend from 1999 to 2014 to determine if there was any change over this period in hiring or retention of women scientists. Comparisons in gender gap among the different categories were made using exact binomial distributions.

Phase 2

We conducted a qualitative study with individual interviews using thematic analysis to provide context for the Phase 1 data and identify strategies to promote gender equity within the research institute.

Participants and recruitment

A purposive sampling strategy along with snowball sampling was used to recruit current or past SMH scientists respectively. We recruited employee and clinician scientists from various career stages. Career stages were defined as early career (< 5 years since initial appointment), mid-career (5 to 10 years since initial appointment) and senior career (>10 years since initial appointment). We targeted 4 to 6 participants from each career stage and from both clinician and employee scientists. These categories were based on differences noted in the Phase 1 data. We anticipated that 4 to 6 participants in each category would be sufficient to reach saturation amongst relatively homogenous groups of participants.(4)

Scientists within each of the categories were identified from the registry and were sent a personalised recruitment letter. Snowball sampling was used to identify individuals who had left the

institution who might be able to offer insight into the gender gap. Sampling continued until saturation of themes was achieved.

Data collection

Semi-structured, individual, telephone interviews were conducted between November 2015 and January 2016. The interviews were conducted by one of 3 experienced interviewers (AM, SJ, JB) using an interview guide. The interview guide was developed by the research team after review of preliminary results from Phase 1 and with a focus on exploring the research institute context, reasons for the gender gap, and strategies to mitigate this disparity. At the onset of the interview, participants were shown some data from Phase 1 to outline the gender gap. The interview guide (available in Appendix 1) was then tested for clarity with 2 people (not included in the data set) and revised. Interviews were audio recorded, transcribed and de-identified to ensure anonymity. Interviewers took field notes during the interviews to serve as a secondary data source.

Analysis

Thematic analysis was used to guide the analysis of the interview transcripts.(5,6) Three qualitative experts conducted the interviews and participated in ongoing memoing during data collection. The codes generated during memoing comprised the initial coding framework. A modified coding consensus approach was used. The coding framework was then reviewed by the research team and applied to a portion (n=4, 19%) of transcripts by two analysts using NVivo 11 software.(7) Inter-rater reliability for the coding was calculated and discrepancies were resolved through discussion. Conceptual changes to the coding framework were then made as necessary. The analysts engaged in a second round of coding on an additional portion (n=5; 23.8%) of transcripts and inter-rater reliability was calculated. After the second round of coding, agreement was found to be good (Kappa coefficients ≥ 0.6) and the remaining transcripts (n=12) were coded by a single analyst. The results were shared with

participants to invite feedback and ensure accuracy; permission was obtained from them to include relevant quotes to support the analysis.

Ethics

The qualitative study was approved by the SMH Research Ethics Board

Results

Phase 1

As of December 30, 2014, 206 scientists had been appointed to the research institute including 30.1% (N=62) women and 69.9% (N=144) men, indicating a 39.8% gender gap. Figure 1 outlines the gender gap in appointments over the 15-year period since the research institute was launched. More men than women were hired each year except for 2004 and 2014. There was no trend observed for differences in hiring over time across job descriptions.

Job description

Gender gaps existed across all job descriptions (Table 1). The majority of full-time scientists (60.3%, N=70) were clinician scientists and the gender gap was largest in this group. Specifically, there were 54.2% more men than women clinician scientists. The smallest gender gap was amongst employee scientists; in this group there were 21.8% more men than women scientists.

Research discipline

Almost 69% (N=142) of scientists were clinical researchers, 20.9% (N=43) conducted basic research, and 10.2% (N=21) conducted both basic and clinical research.(Table 1) Ninety-five percent of basic scientists were men, indicating a 90.5% gender gap. In contrast, among scientists conducting

clinical research, there were 21.2% more men than women. Among employee scientists, there were 14.2% more women than men scientists conducting clinical research.

Academic appointment

201 of the 206 scientists had a university appointment. There was evidence of a gender gap across all university appointments. This gap increased with increasing academic rank; specifically, 85.7% of full professors were men compared with 14.3% who were women, indicating a gender gap of 71.4%.

Phase 2

Twenty-one scientists were interviewed. The interviews were 45 to 60 minutes in duration. The description of the participants is provided in Table 2; detailed demographics cannot be provided to maintain confidentiality. Four participants were former SMH scientists. The majority of participants were clinician scientists, reflecting Phase 1 results.

There were 7 key themes identified from the interviews. We will discuss each of these themes and illustrate with relevant quotes from participants.

Perceived impact of the gender gap

Participants shared various perceptions of how the gender gap may have impacted them, other scientists, and the research culture at SMH.

Personal Impact:

Male participants said they were unaffected by the gender gap. Several women reported feeling negatively impacted by the gender gap. Some of them described a feeling of social isolation and a perception that they are not a priority of the research administration. Some specific examples were

given, such as feeling unheard in scientist meetings and being excluded from meetings outside regular business hours because of presumptions about family responsibilities.

Some female participants felt that they have fewer opportunities for career advancement and received less financial compensation than men. They felt "passed over" for promotions in comparison to male colleagues who had similar or less accomplished CVs. Furthermore, some worried about their job security at the research institute. Participants who left the institute did not leave because of the gender gap but suggested that there may be others who left for that reason.

Some female participants did not feel negatively impacted by the gender gap. They felt fortunate to receive excellent mentorship and support within the research institute. Their perception was that women were not undervalued and that strong female role models were available. Additionally, some wondered whether a gender imbalance, skewed in either direction, could play to a person's advantage; the individual who is different may get noticed and offered more opportunities.

Impact on culture at the research institute:

Participants perceived that the gender gap existed because of the research culture and, in turn, also maintained the culture. First, female perspectives may be less apparent in any discussion on work-life balance. Participants perceived that men are more likely than women to have a partner who is primarily responsible for work inside the home. As a result, male-dominated organizations may produce a work culture that does not favour individuals who have additional responsibilities at home. Female participants said they developed creative solutions for child care and meeting work demands (e.g., hiring volunteers, flexible work hours, etc.)

Second, since there were fewer female scientists, the same women may get asked to participate in various committees and meetings. Participants raised concerns that this may make work-life balance even more challenging for these women and may take time away from their research activities.

Factors perceived to influence the gender gap

Participants were asked to consider what factors might influence the identified gap.

Informal recruitment process:

Participants perceived that the recruitment process was unclear and not transparent. They questioned whether there may be an unconscious gender bias in recruitment, which has persisted through informal hiring strategies. Participants said they were unaware of any information on how candidate searches were performed, how positions were advertised, or how many candidates apply. Participants explained that they were hired as scientists through informal processes. They described a variety of hiring experiences such as having positions created by mentors or colleagues; being invited to join after acquiring grants or research awards; being sought out to run a specific program in their research specialty; and being invited to transfer grants from other institutions.

Participants differentiated between the hiring of clinician and non-clinician scientists. Clinician scientists were recruited through their clinical division head who presents candidates to the research institute. Participants highlighted that the gender gap among clinician scientists may reflect a gap in the recruitment of clinicians in general. Non-clinician scientists were described as being hired more directly through the research institute. Participants perceived there was an informal component to both recruitment channels. Participants speculated that women may not have the same access to informal social networks that exist between men. Since the leadership is predominantly male, they may instinctively network with, and recruit, individuals who are similar to them.

"*Like this person… if I was female would never have invited me out for a beer. It's that level of informal advancement that, thankfully these kind of things are pointed out by my partner who educates me on them, because it's not really something that I've been thinking about. But that is seriously problematic. It's nobody's fault, right? But it's… I mean…. No one is trying to exclude based on gender but doesn't necessarily feel like you're excluding based on gender if you're extending invitations to meet informally with people.*" –male scientist

Historical trends in hiring and retention and proportion of women in pool of eligible candidates

Participants speculated that the existing gender gap might dissipate over time as men in senior positions retire and more women in junior positions advance in their careers. Participants wondered if gender gaps existed in recent hires because there are fewer female candidates. Some participants suggested that women may be less interested in the scientist role due to its lengthy education requirements and impact on work-life balance. The navigation of trade-offs between career and family for women aged 25 to 35 years old was described as challenging.

"*Everything (related to) whether you are going to be an academic scientist or not is decided during your training and if you have family and your training is delayed, if you can't work that much then your publication list is not that good, to be that excellent, you are right away in a disadvantage. And that can happen more often to women than to men*" –female scientist

Research disciplines and gender

Participants noted that the gender gap varied by research discipline and was most pronounced in the basic sciences. Within clinical research, participants perceived variability across particular fields of research; for example, some participants perceived more women in social science research. Some participants raised the issue that certain research disciplines (that may be more male dominated) might be more valued within the research institute than others, thereby contributing to the gender gap.

A similar issue was raised in regards to clinical disciplines. It was mentioned that certain clinical divisions within the hospital tended to have fewer women than others. As a result, clinician scientists who emerged from these divisions tended to be male. Furthermore, there was a perception that clinical divisions with more women also tended to be the divisions that seemed to be understaffed. Female clinicians in these divisions may have less time or resources to engage in research endeavours.

Perceptions of support at the institution

Support from research administration:

Some participants felt strongly supported and others felt they had either no support or no relationship with research leadership. Those who felt supported described receiving: training and administrative resources for grant writing; patience and understanding with regards to the challenges of grant acquisition; support for family leaves; independence with running research activities; and positive feedback on research ideas. Those who did not receive support said they were made to feel like they were not a priority for the research administration. In an environment where funding is hard to acquire, some participants perceived that scientists who are able to acquire larger grants were more valued.

Some participants wondered if research administration knew who they were or what research they were conducting. Some also described experiences of reaching out to the administration but either receiving no response or not a favourable response.

Support from peers:

Overall, participants described that they had very collegial relationships with their peers. They described the research institute as having a generally positive and collaborative research environment. Participants described occasional incidents of unprofessional behaviour. More often than not, the individuals behaving unprofessionally were in more senior positions and were more likely to be male. A few examples of these behaviours included: stealing grant ideas, interrupting established collaborations, and excluding others from group brainstorming meetings. All participants who experienced these behaviours were female, although all female participants did not mention unprofessional behaviour. Participants were unable to say with certainty whether these issues were related to gender, but believed these behaviours were the product of the competitive nature of research.

Access to mentorship

Participants with mentors perceived them to be valuable for providing insight on how to succeed in the scientist role, making them feel valued, giving them feedback, and providing them with opportunities. Participants who did not have any mentorship described the desire for a mentor, especially in the early years of the scientist role.

Suggestions to address the gender gap

Establish transparent and explicit search processes:

Participants suggested that a formal, systematic and transparent search process be used for recruitment to the research institute. It was suggested that resources be invested in creating gender-balanced search committees; fair and wide advertising of scientist job postings (e.g., including minority websites etc.); and thorough screening of local and international applicants. In addition, participants said that scientists and leaders at the research institute should make an effort to ensure that eligible women are sought out and included in the informal networks, which are currently used for recruitment. When it comes to the hiring of clinician scientists, participants felt that the research institute should take a more active role in encouraging clinical division directors to consider whether there is any unconscious gender bias in recruitment. Finally, it was suggested that the search process be documented to ensure transparency.

"*I don't think that this can be addressed until we are going to (have) recruitment which is more open with candidates applying for these jobs from all over, and then we can see whether this gender gap is still there, whether there is a gap among the applicants, and whether there is a gap after the selection process*" –female scientist

Provide career mentorship across career stages:

Participants suggested that the mentorship of junior female researcher and trainees could help narrow the gender gap by empowering interested women to choose the scientist role. In order for early female mentorship to be implemented, participants suggested that the onus should be on research leadership and senior scientists to actively identify future scientists, particularly among women, and create opportunities for support, guidance, and mentorship.

"*There is quite a bit of evidence now that the best predictor of success for scientists is a successful mentor. For very tangible reasons, from tangible reasons as mentors they know how to do research and you can get caught up or you can fall into holes and so on and a good mentor is quite good at seeing those holes.*" –male scientist

Establish institutional support for work-life balance:

Participants described areas where work-life balance strategies can be encouraged, for example, allowing women and men who have young children to remain engaged in research. Some ideas included: having meetings at a time that is more conducive to picking up or dropping off children at school or daycare; having private rooms with storage for pumping breast-milk; encouraging the recruitment of part-time staff or volunteers for extra support; and providing human resources when scientists go on family leave. Some female scientists described the decision to complete a full-term maternity leave was challenging because they feared that they would fall behind in research productivity in comparison to other colleagues. Additionally, clinician scientists mentioned that in smaller clinical divisions if one person goes on maternity leave, the remaining faculty cover the clinical work, which makes work-life balance and engagement in research more challenging.

Interpretation

A significant gender gap exists at this research institute, across job descriptions and research disciplines. Several factors were postulated to contribute to it including the potential for unconscious bias in hiring. Participants identified strategies to consider implementing to overcome the gender gap such as establishing transparent and explicit search processes, providing opportunities for informal networking of women scientists, providing career mentorship and establishing institutional support for activities that promote work-life balance.

The findings from this study address some of the lack of information identified in the 2012 assessment by the Canadian Council of Academies (1), providing recent data on the gender gap at a university-affiliated research institute and context around why the gender gap may exist. Our study indicates that informal search and recruitment processes are likely one contributing factor to the gender gap. This result aligns with findings from a 2009 systematic review of interventions mitigating gender bias in employment that found negative bias against women being evaluated for positions that are traditionally or predominantly held by men.(8) This review identified strategies to mitigate this bias including aiming for an applicant pool with at least 25% women, committing to the value of credentials before applicants are reviewed, and training panel members in unconscious bias and the role that it can play in discussions and decisions.(8) A more recent study found that a 20 minute workshop on implicit biases and strategies for overcoming them changed participants' perceptions of bias.(9) And, a cluster randomised trial of faculty from 92 departments (including medicine) at one university showed an increase in self efficacy to engage in gender-equity promoting behaviours following a 2.5 hour workshop.(10) When more than 25% of department members attended this workshop, there was an increase in self-reported activity to promote gender equity at 3 months.(10)

There are limitations to our study. First, it was conducted at a single institution but it does represent a large and diverse group of scientists who conduct basic and clinical research. Second, the interview findings may not be generalizable to other departments or institutions given the sample size. However, saturation of themes was achieved and the sample included representation from all career stages and job descriptions. Third, we were only able to recruit 4 scientists who had left the institution and thus those individuals who did not participate in the interviews might have different perspectives on the institute.

The gender gap in academics is longstanding and it is highly unlikely that 'the tincture of time' will resolve it given that women have outnumbered men at student and junior faculty levels for more

than 25 years in Canada (1) and research shows that there are no significant differences in baseline career aspirations between women and men (11). Instead, active strategies are needed to address this gap and ensure that the creativity and innovation offered by our diverse population is not lost. To achieve this, programmatic efforts across institutions are required (1,12,13); in particular, it has been suggested that we need to provide equal access to opportunities and resources; manage unconscious bias; support work life balance; and engage leadership locally and nationally.(13)

Future studies should explore 'the training pipeline' to determine where and why we are losing women from potential academic careers. And, we need to develop and test interventions to mitigate gender bias and not expect this to change without explicit intervention – time alone will not bridge this gap.

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Table 1. Gender distribution among scientists

Category	Total N (%)	Female N (%)	Male N (%)
Job Description			
Full Time Scientists	**116 (56.3%)**	**34 (29.3%)**	**82 (70.7%)**
Clinician	70 (60.3%)	16 (22.9%)	54 (77.1%)
Employee	46 (39.7%)	18 (39.1%)	28 (60.9%)
Associate Scientists	**90 (43.7%)**	**28 (31.1%)**	**62 (68.9%)**
Research Discipline			
Basic	**43 (20.9%)**	**2 (4.7%)**	**41 (95.3%)**
Full Time Scientists	32 (74.4%)	2 (6.3%)	30 (93.8%)
Clinician	15 (46.9%)	0 (0%)	15 (100%)
Employee	17 (53.1%)	2 (11.8%)	15 (88.2%)
Associate Scientists	11 (25.6%)	0 (0%)	11 (100%)
Clinical	**142 (68.9%)**	**56 (39.4%)**	**86 (60.6%)**
Full Time Scientists	67 (47.2%)	29 (43.3%)	38 (56.7%)
Clinician	39 (58.2%)	13 (33.3%)	26 (66.7%)
Employee	28 (41.8%)	16 (57.1%)	12 (42.9%)
Associate Scientists	75 (52.8%)	27 (36%)	48 (64%)
Both	**21 (10.2%)**	**4 (19%)**	**17 (81%)**
Full Time Scientists	17 (81%)	3 (17.6%)	14 (82.4%)
Clinician	16 (94.1%)	3 (18.8%)	13 (81.3%)
Employee	1 (5.9%)	0 (0%)	1 (100%)
Associate Scientists	4 (19%)	1 (25%)	3 (75%)
Academic Appointment			
Lecturer	**8 (4%)**	**3 (37.5%)**	**5 (62.5%)**
Full Time Scientists	4 (50%)	1 (25%)	3 (75%)
Clinician	4 (100%)	1 (25%)	3 (75%)
Employee	0 (0%)	N/A	N/A
Associate Scientists	4 (50%)	2 (50%)	2 (50%)
Assistant Professor	**94 (46.8%)**	**37 (39.4%)**	**57 (60.6%)**
Full Time Scientists	39 (41.5%)	19 (48.7%)	20 (51.3%)
Clinician	21 (53.8%)	8 (38.1%)	13 (61.9%)
Employee	18 (46.2%)	11 (61.1%)	7 (38.9%)
Associate Scientists	55 (58.5%)	18 (32.7%)	37 (67.3%)
Associate Professor	**43 (21.4%)**	**11 (25.6%)**	**32 (74.4%)**
Full Time Scientists	32 (74.4%)	8 (25%)	24 (75%)
Clinician	17 (53.1%)	4 (23.5%)	13 (76.5%)
Employee	15 (46.9%)	4 (26.7%)	11 (73.3%)
Associate Scientists	11 (25.6%)	3 (27.3%)	8 (72.7%)
Full Professor	**56 (27.9%)**	**8 (14.3%)**	**48 (85.7%)**
Full Time Scientists	39 (69.6%)	4 (10.3%)	35 (89.7%)
Clinician	28 (61.4%)	3 (10.7%)	25 (89.3%)
Employee	11 (28.2%)	1 (9.1%)	10 (90.9%)
Associate Scientists	17 (30.4%)	13 (76.5%)	4 (23.5%)

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Table 2. Interview participant demographics (N=21)

Variable	Participants (N)
Female	11
Clinician Scientist	13
Employee Scientist	8
Early career (< 5 years)	7
Mid-career (5 to 10 years)	7
Late career (>10 years)	7
Past SMH scientist	4

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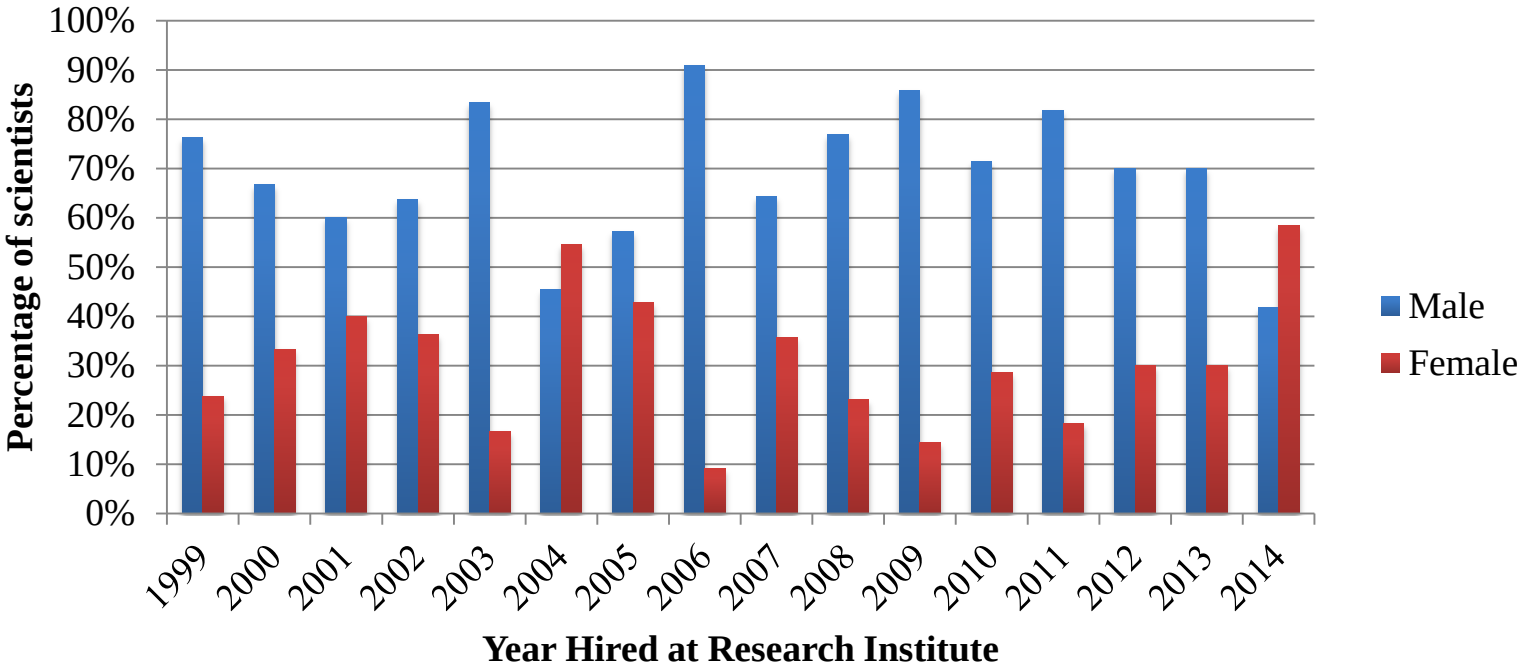
Figure 1. The gender gap in appointments from 1999 to 2014.



Appendix 1: Interview Guide

The semi-structured interview guide is presented below; it is meant to convey the general line of questioning. The interviewers were encouraged to explore issues that arose during the interview that were not addressed by the interview guide. Note that throughout the data collection phase of the study the guides are dynamic may be refined to reflect the important themes emerging in particular participant interviews.

Section 1: Semi-Structured Questions

Currently, there are 208 scientists at the Li Ka Shing Knowledge Institute (LKSKI) of St. Michael's Hospital, of whom only 29.8% (N=62) are women compared to a large percentage (70.2%, N=146) who are male scientists, indicating a wide (40.4%) gender gap. Compared with other academic hospitals, LKSKI has the largest gender gap.

1. What is your interpretation of these data?

2. Do you think the gender gap has influenced the work environment at LKSKI?

    a. if yes, how so? (probe for examples)

3. In your opinion, what are some of the reasons this gender gap exists?

4. Have you been personally impacted by this gender gap?

    a. if yes, how so? (probe for examples)

5. *Past employees*: What are the reasons you left LKSKI?

    b. Did the gender gap at LKSKI have any impact on your decision to leave?

6. In your opinion, how should this gap be addressed (if at all)?

7. Do you believe this gap should be monitored over time?

a. If yes, how so? (probe for suggestions)

Section 2: Structured Questions

1. How long have you been working as a scientist? (please select the appropriate category)

◯ <5 years

◯ 5 – 15 years

◯ >15 years

2. What is your gender?

◯ Male ◯ Female

3. Are you a clinician by training?

◯ Yes ◯ No

4. Are/were you a full time or part time scientist?

◯ FT ◯ PT

Consolidated criteria for reporting qualitative studies (COREQ): 32-item checklist

Submission to CMAJ Open

Title: Mind the gap: perceptions and experiences of a gender gap at a Canadian research institute and potential strategies to mitigate this gap, a mixed methods study.

Authors: Mascarenhas A, Moore JE, Tricco A, Hamid J, Daly C, Bain J, Jassemi S, Kiran T, Baxter N, and Straus S.

No. Item	Guide questions/description	Response
Domain 1: Research team and reflexivity		
Personal Characteristics		
1. Interviewer/facilitator	Which author/s conducted the interview or focus group?	Alekhya Mascarenhas, Sabrina Jassemi, and Julie Bain; stated in text (methods)
2. Credentials	What were the researcher's credentials? E.g. PhD, MD	Alekhya Mascarenhas, MPH, Research Coordinator, Li Ka Shing Knowledge Institute, St. Michael's Hospital Julia E. Moore, PhD, MSc, Research Program Manager, St. Michael's Hospital Andrea C. Tricco, PhD Li Ka Shing Knowledge Institute,, MSc, Scientist, Li Ka Shing Knowledge Institute, St. Michael's Hospital Jemila Hamid, PhD, MSc, Scientist, Li Ka Shing Knowledge Institute, St. Michael's Hospital, McMaster University Caitlin Daly, MSc, Graduate, St. Michael's Hospital, Julie Bain, BSc, Research Assistant, Li Ka Shing
3. Occupation	What was their occupation at the time of the study?	

		Knowledge Institute, St. Michael's Hospital Sabrina Jassemi, BSc, Research Assistant, Li Ka Shing Knowledge Institute, St. Michael's Hospital Tara Kiran, MD, MSc, Associate Scientist, Li Ka Shing Knowledge Institute, St. Michael's Hospital, University of Toronto Nancy Baxter, MD, PhD, Scientist, Li Ka Shing Knowledge Institute, St. Michael's Hospital, University of Toronto Sharon E. Straus, MD, MSc, Director, Knowledge Translation Program, Li Ka Shing Knowledge Institute, St. Michael's Hospital
4. Gender	Was the researcher male or female?	All researchers were female
5. Experience and training	What experience or training did the researcher have?	Dr. Sharon Straus is a principal investigator for numerous qualitative and quantitative studies. Jemila Hamid and Caitlin Daly are experienced biostatisticians. Alekhya Mascarenhas is a highly skilled qualitative analyst. She oversaw the research assistants (Julie Bain and Sabrina Jassemi) who have been trained in qualitative data collection. The remaining authors are all researchers in their own right – both in quantitative and qualitative research. They provided input on the manuscript and final reports from this research study. With the exception of Tara Kiran and Nancy Baxter, all the authors are a part of the Knowledge Translation Program of which Dr. Sharon Straus is the director.

Relationship with participants		
6. Relationship established	Was a relationship established prior to study commencement?	There was no relationship established prior to study commencement.
7. Participant knowledge of the interviewer	What did the participants know about the researcher? e.g. personal goals, reasons for doing the research	Participants knew that the intent of the research was to explore experiences and perceptions of the gender gap at their research institution.
8. Interviewer characteristics	What characteristics were reported about the inter viewer/facilitator? e.g. Bias, assumptions, reasons and interests in the research topic	There were no characteristics reported about the interviewers.
Domain 2: study design		
Theoretical framework		
9. Methodological orientation and Theory	What methodological orientation was stated to underpin the study? e.g. grounded theory, discourse analysis, ethnography, phenomenology, content analysis	This was a sequential mixed methods study. Phase 1 was a descriptive analysis of quantitative data. Phase 2 was a thematic analysis of qualitative interviews; stated in text (methods)
Participant selection		
10. Sampling	How were participants selected? e.g. purposive, convenience, consecutive, snowball	Purposive and snowball sampling; stated in text (methods)
11. Method of approach	How were participants approached? e.g. face-to-face, telephone, mail, email	Participants received a personalized email invitation letter; stated in text (methods)
12. Sample size	How many participants were in the study?	Twenty-one participants
13. Non-participation	How many people refused to participate or dropped out? Reasons?	We are not aware of any individuals that refused to participate in the study. No participants dropped
Setting		
14. Setting of data collection	Where was the data collected? e.g. home, clinic, workplace	Telephone interviews in private meeting rooms in the Li Ka Shing Knowledge Institute at St. Michael's Hospital.
15. Presence of non-participants	Was anyone else present besides the participants and researchers?	No

16. Description of sample	What are the important characteristics of the sample? e.g. demographic data, date	Gender, job title, and, career stage; stated in Table 2.
Data collection		
17. Interview guide	Were questions, prompts, guides provided by the authors? Was it pilot tested?	The semi-structured interview guide was developed and tested with two participants (not included in the data set). The interviewers were encouraged to explore issues that arose during the interview that were not addressed by the interview guide. Throughout the data collection phase of the study the guide was dynamic was refined to reflect the important themes emerging in particular participant interviews; stated in text (methods) and appendix 1.
18. Repeat interviews	Were repeat inter views carried out? If yes, how many?	N/A
19. Audio/visual recording	Did the research use audio or visual recording to collect the data?	Interviews were audio recorded; stated in text (methods)
20. Field notes	Were field notes made during and/or after the inter view or focus group?	Interviewers took field notes and wrote memos during the interviews to serve as a secondary data source; stated in text (methods)
21. Duration	What was the duration of the inter views or focus group?	Interviews lasted a maximum of 60 minutes.
22. Data saturation	Was data saturation discussed?	Yes, interviews were conducted until saturation of themes was met.
23. Transcripts returned	Were transcripts returned to participants for comment and/or correction?	Yes, all participants who were interested had the opportunity to read and comment on their own transcripts.
Domain 3: analysis and findings		
Data analysis		
24. Number of data coders	How many data coders coded the data?	Two analysts coded the data; stated in text (methods)
25. Description of the	Did authors provide a description of the	N/A

coding tree	coding tree?	
26. Derivation of themes	Were themes identified in advance or derived from the data?	Themes were derived from the data. Three qualitative experts conducted the interviews and participated in ongoing memoing during data collection. The codes generated during memoing comprised the initial coding framework.
27. Software	What software, if applicable, was used to manage the data?	NVivo 10
28. Participant checking	Did participants provide feedback on the findings?	Yes, all participants received a copy of the final report. They were also invited to an open forum where the results were presented with an opportunity for feedback and Q&A.
Reporting		
29. Quotations presented	Were participant quotations presented to illustrate the themes/findings? Was each quotation identified? e.g. participant number	Yes, participant quotations were used. They were identified by gender and job title.
30. Data and findings consistent	Was there consistency between the data presented and the findings?	Yes
31. Clarity of major themes	Were major themes clearly presented in the findings?	Yes
32. Clarity of minor themes	Is there a description of diverse cases or discussion of minor themes?	Yes