EVALUATION OF THE ROLE AND CAREER PATH OF CANADIAN RESEARCH ADMINISTRATORS IN HIGHER EDUCATION

Jyoti Kotecha
Carbon to Metal Coating Institute, Queen's University, & Centre for Studies in Primary Care, Department of Family Medicine, Queen's University.

Sophie Felleiter
The Stephen J. R. Smith Faculty of Engineering and Applied Science, Queen's University.

Alisha Seguin
CARA Career Task Force Volunteer, Ottawa, Ontario, Canada.

Kristen Korberg
CARA Career Task Force Chair; KLK Research Consulting, Vernon, British Columbia, Canada.

Erica L. Conte
Unity Health Toronto, 30 Bond Street, Toronto, Ontario, Canada.

ABSTRACT

Research managers and administrators (RMA) play a vital role in supporting the research mandate of Canadian higher education institutions (universities, colleges, and hospital research) by aiding researchers to successfully obtain funding, comply with granting agency policies, and to manage collaboration. However, the role is not well understood due to broad scope, and RMA are not aware of career options, or skills required for career progression. To better understand the profession, and the skills required to perform responsibilities, the Canadian Association of Research Administrators Career Path Task Force conducted a sequential mixed methods study. The study included an environmental scan of job postings (*n*=120), an online survey (*n*=138) and interviews (*n*=9) to assess qualifications, skills, remuneration rates, duties, and professional development needs of RMA. Findings confirmed the broad scope (e.g., grant writing and management, financial oversight, research contracts, and ethics compliance.) Entry into the field has shifted, often requiring graduate degrees, making the profession appealing to PhD's seeking better work-life balance. Critical thinking, project management, exemplary communications, attention to detail, best practice in equity, diversity, and inclusion were skills identified as future focus for professional development. Mentorship was identified as critical to career progression, and fair remuneration and benefits facilitated retention.

Keywords:

Research administration, career path, research management, research finance, research agreements, data management, advancement, evaluation

INTRODUCTION

Research administration (or research management) is a growing profession around the globe. In higher education and hospital-based research institutes, the role encompasses a broad range of duties including research grant application, grant administration, accounting and finance management, ethics compliance, report writing, contract negotiations, intellectual property applications and commercialization. This diversity of work and ambiguity in responsibilities creates difficulties for those trying to map out their long-term career goals within the profession.

Recognition of the role as a profession is fairly young. Research Administrators were first observed in the 1940s-50s as holding a unique employment role. Before this time, individual faculty conducted research administration activities in addition to their research and teaching duties (Monahan et

al., 2023). However, due to an increasing number of grant opportunities and a subsequent need for application expertise and management, this niche area expanded, and research administration became formalized as a profession through the founding of the National Council of University Research Administrators (NCURA) in 1958 and the subsequent formation of the Society of Research Administrators (SRA), later rebranded SRA International (SRAI) (Kulakowski, 2023). Outside of the United States, Canada was the first to establish its own national supporting organization known as CAURA (the Canadian Association of University Research Administrators) and later changed to CARA (Canadian Association of Research Administrators) in 1972. Many international jurisdictions followed suit throughout the 1990s and 2000s, creating bodies like the Association of Research Managers and Administrators (ARMA) in the United Kingdom (1991), the European Association of Research Managers and Administrators (EARMA) in Europe (1994), and comparable associations around the globe including within Australia, Africa, Asia, and South America.

While the formation of these professional societies has helped to solidify the profession of research administration, administrators continue to have very few established professional standards with which to compare candidates during the hiring process or to aspire to for their own professional development. To address this, some national societies have started developing their own professional development education opportunities, such as the certificates offered by the Society of Research Administrators International (SRAI) in the United States (https://www.srainternational.org/meetings/certificate-programs), the Certificates in Research Administration or Research Management and Coordination offered through CARA in Canada (https://cara-acaar.ca/certifications), or the Certificate in Research Management (Foundation or Advanced) offered by ARMA-UK (https://arma.ac.uk/qualifications/). Finally, Japan is the first to establish a Certification Board for Research Administration and Management Skills, which offers training in 15 subject matter areas that are recognized by university executives, faculty and other stakeholders (University of Tokyo, 2014). Conversely, in other parts of the world, the roles, function and expertise of those in research administration are often unclear and continually evolving over time (Virágh et al., 2019).

More recently, scholars began to study Research managers and administrators (RMA) as a profession. In 2016, Kerridge and Scott led the first Research Administration as a Profession (RAAAP) international survey, which asked research managers and administrators about the key skills, attitudes and behaviours needed for leaders in the field (Kerridge & Scott, 2018). This initial survey highlighted the vast regional differences across 64 countries that participated in the study. This was followed by a second survey, RAAAP-2, which focused on Research Impact, as well as a third iteration in 2022, that specifically examined "How I Became a Research Manager and Administrator" to map out the various career paths charted by members currently in the profession (Oliveira et al., 2023). A discernible limitation of this work, however, is that the methods that helped people to enter and advance in the profession five, ten or even twenty years ago, are vastly different than what is needed in the present day, where research administration has become increasingly specialized as a result of a rapid expansion of the field. The traditional 'jack-of-all-trades' or generalist RMA opportunities have now become multiple specialized advanced roles, with a much greater focus on research development than other administrative roles (Zink et al., 2022).

In an attempt to better understand educational levels to support entry and career progression in the profession, Ito and Takahashi analysed the dataset from Research Administration as a Profession 2 (RAAAP-2) and determined that perceived 'job attraction' and 'academic degrees after engaging as an RMA' were both positively correlated to total years as a research manager and administrator (RMA) (Ito & Takahashi, 2023). Conversely, 'regard for professional qualifications' was not significantly related to total years as an RMA. So, while these professional qualifications

may have value to secure entry into the profession, they currently do not lead to a significant increase in required skill sets for progression in specialized RMA roles. Of note, this effect may change over time as these various professional qualifications become more commonplace as a differentiator among job candidates.

While understanding that academic degrees correlated with years in RMA, it remains unclear what degrees or levels of education are sought as key qualifications to secure various RMA positions. For example, it remains unclear what higher-education degrees (e.g. Master's or PhD) are required for entry-level positions, which professional certifications are valued in research administration (e.g. contracts, ethics, project management, risk management) or research development (e.g. grant writing/development), or which credentials are needed to hold leadership positions (e.g. PhD, MBA, JD). Furthermore, are the 'requirements' for a position that are included in a job posting truly what are required to obtain that position? For example, many research development postings do not state a requirement for a PhD, and yet many of the successful candidates for these roles not only hold a PhD, but also have postdoctoral training and experience. Understanding this discrepancy is crucially important for those looking to map out long-term career perspectives.

Finally, the principles of equity, diversity, and inclusion (EDI) have evolved rapidly over the past decade and are now considered to be foundational research skills (Ruzycki & Ahmed, 2022). Applying evidence-based EDI principals to support staff and faculty recruitment is widely encouraged to drive excellence and innovation at educational institutions (Swartz et al., 2019; Olzmann, 2020). However, the RMA profession still does not reflect the diversity of the population, leading one to ask what systemic barriers might be in place within these professions and whether the profession has provided an inclusive environment for equity and diversity to flourish.

This study aims to elucidate the various job requirements and hiring practices in the Canadian RMA workforce through a quantitative and qualitative assessment of career paths, job skills, and hiring practices to develop recommendations to support the professional development needs of Canadian RMA.

METHOD

This study was approved by Queen's University's General Research Ethics Board.

A sequential explanatory mixed-method approach was utilized, wherein quantitative data was collected via an environmental scan of publicly available job postings (Phase 1), an online survey of CARA members (Phase 2), as well as the collection of qualitative data via virtual semi-structured interviews with RMA members of CARA (Phase 3) at various career levels (categorized as Early, Mid, and Senior). Participants were recruited from the Canadian Association of Research Administrators (CARA), which is a professional organization dedicated to supporting over 1000 members across Canada in the diverse field of research management and administration.

Participants and Data Collection

Phase 1 – Environmental Scan

The Task Force collected and analyzed job advertisements posted to the CARA listserv and to Canadian public facing institutional websites and/or job boards between April 2022 and January 2023 to identify the educational and work experience requirements advertised within a variety of RMA job descriptions.

Phase 2 – Online Survey

A cross-sectional online survey was designed and disseminated to all CARA registered members (n=1000) between May 2023 to September 2023. We received 192 responses, 148 surveys were completed, and 138 were deemed eligible to be included in the study. The survey was designed using digital software, QualtricsTM. The CARA Career Path Task Force followed the general recommendations of anonymity, privacy, and confidentiality from ethical practice guidelines for online research (Gupta, 2017).

Phase 3 – Semi-structured Interviews

Purposeful sampling was used to select RMA from currently registered members of CARA to participate in virtual (30-35 minute) semi-structured interviews. Purposeful sampling was used to ensure representation from Early, Mid, or Senior career level RMA, various geographic locations across Canada, and across types of RMA work environment (college, university, hospital). Interviews continued until saturation of information was achieved (*n*=9).

Data Analysis

Phase 1 – Environmental Scan

Jobs were assessed by members of the CARA Career Path Task Force as either 'research administration' or 'research development'. Research administration was defined to include positions that primarily supported institutional research activities, such as finance, contracts, human resources, or ethics. Research development was defined to encompass positions that develop research through grant development or through research strategy. Jobs were further sub-divided based on annual salary into four categories: 1) <$60,000, 2) $60,000-$70,000, 3) $70,000-$80,000, and 4) >$80,000. When the job posting included a salary range, the value at the bottom of the range was used.

Phase 2 – Online Survey

Both Demographic and descriptive data were analyzed using descriptive statistics.

Phase 3 – Semi-structured Interviews

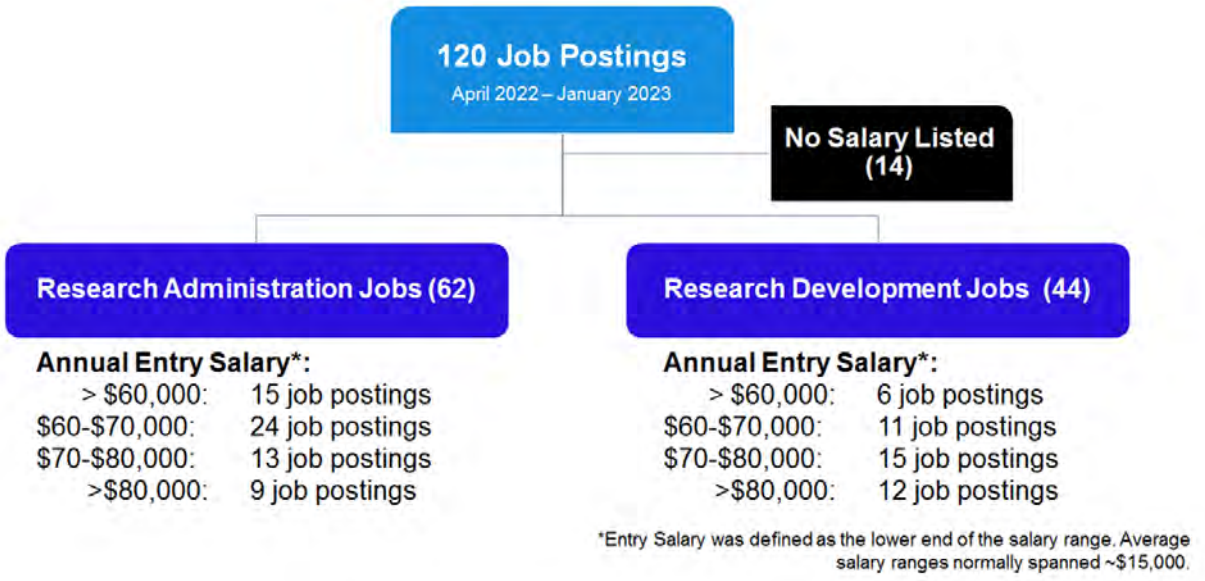
Transcripts were thematically coded by two independent research associates, with overarching themes validated by an external peer auditor.

DISCUSSION

Environmental Scan

Over a ten-month period, 120 job postings posted to the CARA listserv or publicly advertised on Canadian higher education institutional websites were analyzed. This included job postings from 60 different institutions spread across six provinces including British Columbia (24), Alberta (8), Manitoba (2), Ontario (75), Quebec (8), and Nova Scotia (3). While these were heavily weighted from Ontario, there was representation of provinces in both eastern and western Canada. Proportional to the amount of research in Quebec, the number of postings were small, which was likely a result of them being in French language and therefore posted more frequently on separate provincial job posting sites.

Figure 1
Breakdown of Job Postings by Type and Salary



Of these 120 postings, we were unable to identify the salary for 14 postings, which eliminated them from subsequent assessment. Of the remaining postings, 62 were deemed 'research administration' positions and 44 were categorized as 'research development' positions (**Figure 1**).

We then sub-categorized the jobs based on their posted salary bands. When a salary range was provided, we used the bottom of the salary range for this categorization. According to the 2021 Census of Statistics Canada, the median after-tax income for Canadians was $68,400. We found that RMA respondents reported average to above average salaries in comparison with the national average (Statistics Canada, 2023).

Table 1 displays titles, education and experience required at the various salary bands for job positions in research administration or research development, respectively. As salary bands increased, we observed a general rise in the required level of education and corresponding experience mandated for the role. Positions in research development required a higher level of education (Master's, PhD) both at entry levels and more senior levels compared to similar pay bands for positions in research administration.

This may indicate that research development positions are regarded to require more of the skills obtained through higher education degrees.

Although the environmental scan clearly identified the education levels and experience requirements for RMA positions, it was rare to see any specific disciplinary backgrounds (e.g. Majors) identified as preferred educational requirements in job descriptions. This is likely due to the need for RMAs to support a broad range of research.

Survey

We received 192 total responses to our survey. Of these, 148 finished the survey, and 138 met all eligibility criteria.

Demographics

Participants were respectfully asked to self-identify their race-based and/or Indigenous identities according to recommended demographic questions outlined by the Canadian Institute for Health Information (CIHI, 2022). Participants were further requested to self-identify their gender identities based on demographic guidelines from the Government of Canada (Government of Canada, 2021).

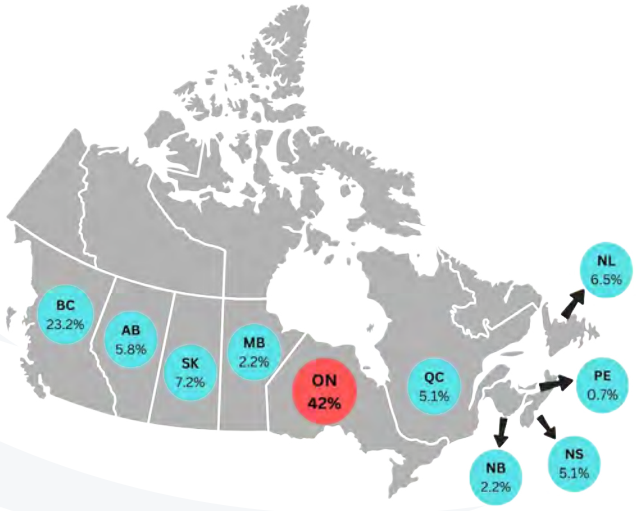
Table 1
Research Positions – Education, Experience, and Salary

Research Administration (62 Postings)		Research Development (44 Postings)	
Annual Starting Salary <$60,000			
Job Titles: Research Financial Administrator/ Specialist/Officer Junior Accountant Research Financial Support Research Grants and Contracts Officer Research Contracts Analyst Research Data and Records Assistant Research/Compliance Coordinator Officer Projects and Budgets Research Ethics Coordinator Administrative Assistant Program Officer - Research Admin	**Education:** 80% required an undergraduate degree/diploma 20% required a Master's **Experience:** 73% required 0-3 years 27% required +3 years	**Job Titles:** Research Grants Coordinator Research Grants Development Officer Proposals Coordinator Grants Facilitator Honours and Awards Facilitator Senior Research Advisor	**Education:** 50% required an undergraduate degree/diploma 50% required a Master's **Experience:** 50% required 1 year 50% required 3+ years

Annual Starting Salary $60,000-$70,000			
Job Titles: Centre Coordinator Internal Research Grants Coordinator Research Operations Coordinator II Program and Training Coordinator Implementation Project Manager Research Analyst Research Contracts Coordinator/Analyst Post-Award Administrator Research Compliance Coordinator Research Financial Analyst/Officer Research Ethics Coordinator Grants and Agreements Officer Research Awards and Funding Manager Research Equity Specialist	**Education:** 96% required an undergraduate degree/diploma 4% required a CPA **Experience:** 25% required only 0-2 years 71% required 3-5 years 4% required +5 years	**Job Titles:** Research Grants Officer/Specialist Research Facilitator Research Development Support Administrator Research Development Officer Research Officer (Industrial Relationships) Research Partnerships Officer	**Education:** 72% required an undergraduate degree/diploma 19% required a Master's 9% required a PhD **Experience:** 64% required 2-3 years 36% required 4+ years
Annual Starting Salary $70,000-$80,000			
Job Titles: Research Accountant Financial Analyst, Research Research Finance Supervisor Senior Financial Analyst, Research Grants Senior Grants & Contracts Specialist Research Contracts and Agreements Officer Research Contracts Specialist/Advisor Research Facilitator Manager, Research Administration + Operations	**Education:** 69% required an undergraduate degree/diploma 31% required a Master's **Experience:** 46% required 3 years 54% required 5+ years	**Job Titles:** Research Development Associate/Officer Grant Development Specialist/Officer Manager, Research Grants Funding and Awards Specialist Research Awards Officer Research Facilitator Research Analyst/Officer Policy Analyst Strategic Project Manager Coordinator, Strategic Initiative CRC Mentorship Consultant	**Education:** 28% required an undergraduate degree/diploma 72% required a Master's **Experience:** 58% required 3 years 42% required 5+ years
Annual Starting Salary >$80,000			
Job Titles: Research Contracts Officer/Specialist Senior Grants and Agreements Officer Senior Awards & US-Federal Compliance Officer Legal Advisor/Counsel Associate Director, Research Systems Senior Director, Research Operations	**Education:** 88% required an undergraduate degree/diploma 12% required a Master's Degree	**Job Titles:** Grants Officer Research Funding Manager Research Partnerships Officer Strategic and Institutional Research and Award Specialist Research Development Officer EDI Advisor - Research Partnership Development Officer Director, Research and Partnerships Senior Manager Director, Strategy & Operations Associate Director	**Education:** 25% required an undergraduate degree/diploma 58% required a Master's 17% required a PhD

Survey participants indicated that they were located across Canada (**Figure 2**) and 97.8% (*n*=135) held full-time positions. Out of those that met all eligibility criteria, 86% (*n*=119) self-identified as women, 12% (*n*=16) as men, and 2% (*n*=3) as Prefer not to disclose. In terms of ethnicity, 81.8% (*n*=113) self-identified as being from white population groups and 12.4% (*n*=17) responded that they were from visibly racialized groups. These number do not correlate to the Canadian workforce data (Statistics Canada, 2023) which showed that 47% of the workforce over the age of 15 were those that self-identified as women, and 28.9% of these identified as visible minorities. This lack of diversity in the RMA population leads us to wonder if there is equal opportunity to gain the education and skills required for these positions or if there are additional EDI barriers to career entry and advancement beyond skill set. Of those that participated, 4.4% (*n*=6) were less than 1 year in RMA, 24.6% (*n*=34) were deemed to be Early career researchers (1-5 years in RMA), 33.3% (*n*=46) were deemed to be at Mid-career level (5-10 years in RMA) and 37.7% (*n*=52) were deemed to be Senior-career level (11+ years in RMA).

Figure 2
Participant Geographic Representation



BC= British Columbia, AB= Alberta, SK= Saskatchewan, MB= Manitoba, ON= Ontario, QC= Quebec, NB= New Brunswick, NS= Nova Scotia, PE= Prince Edward Island, NL= Newfoundland and Labrador.

Qualifications

A majority of our participants noted that they had post-secondary qualifications, with 16.7% having an undergraduate degree (*n*=23), 44.2% having a Master's degree (*n*=61) and 30.4% having a PhD degree (*n*=42). The pattern identified indicates that higher education levels are required to successfully enter and pursue a career in RMA, and that most hold a graduate degree at entry. The requirement for higher education could be due to the diversity and complexity of the role, as well as to attract those with higher educations to apply given the over saturation of suitable candidates holding a master's or doctoral level education. Our interviews further confirmed this finding. When categorized by career stage, Early career RMA had a higher incidence of Doctoral education compared to Mid and Senior (40% compared to 30% and 23% respectively). This may be due to either the hiring climate for faculty in academia, where a higher number of doctoral graduates compete for employment compared to the number of positions available, or it may be attributed to the RMA role providing a more attractive work life balance for doctoral graduates.

Roles

To assess the scope, function and remuneration of the RMA role we asked participants to categorize their role, units of operation and remuneration levels. The most described unit of operation was Research and Grant Development (72.5%, *n*=100), with others almost evenly spread across operations units that included Contracts and Partnership Development (27.5%, *n*=38), Research Finance (21.7%, *n*=30), Ethics and Compliance (16.7%, *n*=23), with the remaining participants classifying as belonging to Other (19.6%, *n*=27) units across the institutions they represented.

When it came to categorizing their role, 50.7% (*n*=70) noted they held an operational role, 27.5% (*n*=38) held manager positions, 15.2% (*n*=21) held leadership roles, 2.2% (*n*=3) held assistant level roles and 4.4% (*n*=6) classified their role as Other which did not fit

into any of the above categories. A high percentage of Senior-Career RMA categorized themselves as Managers/Leaders (38%, *n*=20 and 25%, *n*=13 respectively) compared to Mid (30%, *n*=14 and 7%, *n*=3 respectively), and Early (10%, *n*=4 and 13%, *n*=5 respectively).

With respect to compensation, the starting range for respondents was $40,000–50,000 (1.4%, *n*=2) however, the majority were in the range of $71,000-100,000 (54.4%, *n*=75). This can be partly attributed to a high percentage of respondents that qualified their role as being either management or leadership in nature. Relatedly, the more education a participant had appeared to be correlated with their having a higher salary range. These findings mirror results from the environmental scan of job postings (**Table 1**). Of those making >$120K/year (*n*=16), participants with Doctoral degrees were the highest percentage (44%, *n*=7), followed by Master's (38%, *n*=6) and bachelor's degrees (6%, *n*=1). However, this trend did not follow for the mid-salary ranges of $81-100K or $101-120K. Of those with a salary under $71K (*n*=22), participants with bachelor's degrees comprised the largest proportion (41%, *n*=9), compared to Master's (36%, *n*=8) and PhDs (9%, *n*=2). Combined, these results mirror those in the job posting analysis, indicating the importance of possessing upper-level degrees to qualify for a higher salary at entry level as well as provide more opportunities for senior level advancement.

There are some clear patterns indicating higher salary for Mid and Senior career stage RMAs. The most common ranges for Early and Mid-career participants were $71-80K and $81K-100 respectively. The most common range for Mid-career was $81-100K. Salaries greater than $120K and $101-120K were more common for Senior Career RMAs (25%, *n*=13 and 19%, *n*=10 respectively), than for Mid (11%, *n*=5 and 2%, *n*=1 respectively) or for Early Career RMAs (5%, *n*=2 for both). The Early had the most respondents in the $40-50K and $51-60K ranges (5%, n=2 and 7.5%, *n*=3) compared to Mid (2%, *n*=1 for $51-60K and none in $40-50K range) and Senior (none in either) categories.

Skills

Survey respondents were asked to indicate the top five skills (see column 2 of **Table 2**) they believed to be most important in their current role. They were able to choose from 31 skills or indicate "Other" if a critical skill needed was not listed. Across all career stages, the most commonly chosen skills were Communication (64%, *n*=88), Attention to Detail (54%, *n*=75), Critical Thinking (35%, *n*=48) and Problem-Solving skills (31%, *n*=43).

Table 2
Top Skill Sets Most Important in Current Role

Category	
1. Critical Thinking	critical thinking, problem solving, attention to detail
2. Conflict	conflict management, resolving conflict
3. Leadership	leadership, initiative, prioritization, networking
4. Coordination	coordination, facilitation, planning, project management, record keeping
5. Time	scheduling, time-management
6. Teamwork	teamwork, collaboration, adaptability
7. Communication	persuasion, negotiation, communication, empathy, cultural fluency
8. Finance	numerical, budgeting, analytical
9. Research	grant writing, technical, synthesizing information, research

Table 3
Skills Required

Most important skills for current role (adjusted to 9 categories)				
	Early Career	Mid-Career	Senior-Career	Total
Critical Thinking	**34 (85%)**	**37 (80%)**	**47 (90%)**	**118 (86%)**
Conflict	3 (8%)	3 (7%)	4 (8%)	10 (7%)
Leadership	15 (38%)	19 (41%)	**26 (50%)**	60 (44%)
Coordination	**33 (83%) E**	**33 (72%)**	**26 (50%)**	**92 (67%)**
Time	9 (23%)	13 (28%)	12 (23%)	34 (25%)
Teamwork	19 (48%)	12 (26%)	25 (48%)	56 (41%)
Communication	**32 (80%) E**	**29 (63%)**	**36 (69%)**	**97 (70%)**
Finance	12 (30%)	15 (33%)	16 (31%)	43 (31%)
Research	15 (38%)	20 (43%)	18 (35%)	53 (38%)
Skills you wish you had when started your current role (adjusted to 9 categories)				
	Early Career	Mid-Career	Senior-Career	Total
Critical Thinking	3 (8%)	5 (11%)	11 (21%)	19 (14%)
Conflict	**23 (58%)**	**25 (54%)**	**31 (60%)**	**79 (57%)**
Leadership	**27 (68%)**	**26 (57%)**	25 (48%)	**78 (57%)**
Coordination	**21 (53%)**	**26 (57%)**	**27 (52%)**	**74 (54%)**
Time	7 (18%)	15 (33%)	9 (17%)	31 (22%)
Teamwork	7 (18%)	11 (24%)	12 (23%)	30 (22%)
Communication	**30 (75%)**	**36 (78%)**	**40 (77%)**	**106 (77%)**
Finance	**21 (53%)**	20 (43%)	12 (23%)	53 (38%)
Research	14 (35%)	13 (28%)	25 (48%)	52 (38%)

Note: **Bold** font highlights the most common skills identified.

Many of the 31 skills given as an option overlapped (e.g. Time Management and Scheduling). As such, we grouped related skills into nine categories (**Table 3**). Across all career stages, skills in Critical Thinking (86%, *n*=118), Communication (70%, *n*=97), and Coordination (67%, *n*=92), were most often selected by respondents. Leadership skills were also noticeably high (50%, *n*=26) for the Senior career stage group.

Respondents were also asked to choose from the same list of 31 skills to indicate the top five skills they wished they had prior to entering their current role. Across all career stages, Conflict Management was most often selected (46%, *n*=64). Other often chosen skills included Cultural Fluency (34%, *n*=47), Networking (33%, *n*=45), Budgeting (32%, *n*=44), and Resolving Conflict (31%, *n*=43). When adjusted to nine categories of related skills across all career stages, skills in Communication (77%, *n*=106), Conflict (57%, *n*=79), Leadership (57%, *n*=78), and Coordination (54%, *n*=74) were most often selected. Skills in Finance were also a popular choice in the Early career group (53%, *n*=21) and skills in Research for the Senior career group (48%, *n*=25). Research encompasses writing, research, synthesizing and technical skills. Senior career respondents as a group have the fewest PhDs, but the most college/undergraduate credentials, suggesting that Early career RMA with higher education have more confidence in their research and technical skills.

Critical Thinking was the least chosen, suggesting that skills in Critical Thinking, Problem Solving and Attention to Detail are what people often arrived to

the job with. Time and Teamwork were also notably low in the list of desired skills to acquire. Again, these are possibly seen as skills more people have brought to their current role, or perhaps are not seen as important to RMA roles (i.e. 'Scheduling' was rarely chosen, and few respondents reported being in an "Assisting" role).

Communication was chosen in both (have, wished-for) lists, but we found that the communication skills chosen in "wished for" were more often "Cultural Fluency", "Persuasion" and "Negotiation".

Professional Development (PD)

Data suggested that PD related to Leadership, EDI, Budgeting (i.e., research budget management and reporting), and resources to support advancement in an RMA career would be helpful to the profession. This is in line with the skills that RMAs wish they had coming into their positions including Cultural Fluency and Leadership. However, only 28.2% (*n*=39) felt that CARA could provide the required resources. When asked if either the Research Administration or Management Certificates CARA offers were utilized, 18.8% (*n*=26), noted that they had enrolled in or completed the programs. Those that did enroll/complete the programs noted 77% (*n*=20) that they found the program useful.

Semi-structured Interviews

Our interviews allowed us to more fully explore the role, duties, skill sets, professional development needs, and perceptions of systemic EDI barriers by CARA members currently employed in a variety of RMA roles across colleges, universities, and hospital research units in Canada. Major themes are described here.

Role

Participants held various roles (e.g. research advisors, clinical research director, contract manager) and were in various career stages ranging from Early to Senior careers. Independent of career level and position area, all described their role as broad ranging from pre/post grant application support, research finance, research contracts, and research ethics and data management. A common theme that emerged independent of the position and type of institution was the role's broad scope, the need to adapt to change daily, and to interact with other support staff and stakeholders to perform their roles well.

> *"It's a pretty broad position…you have to be more of a jack of all trades." (Participant 5)*

> *"So, it's a bit of a — don't know what's going to walk in the door the next day — kind of a role. …. we kind of interact across the institution in a lot of different areas and also across the country." (Participant 7)*

> *Often the role was described as advising on grant applications and negotiating research contracts.*

> *"We work with the researchers in all of the departments, in developing research programs…in matching their projects or programs to grant funding opportunities…advanced drafts of specific grant applications…formal administrative faculty level review of the grant application." (Participant 9)*

> *"…review and negotiate all research related agreements at the hospital. So, this includes things like um clinical trial agreements with pharma companies or device companies, like industry partners uh also other investigator led studies…. see everything from non-disclosure agreements to data transfer agreements, to clinical trial agreements. So, it is legal language." (Participant 7)*

With RMA in areas related to ethics and data security the role was described as that of a consultant:

"…. a consultation. We do a lot of that. So, somebody will come to us with a question. It could be – I'm trying to start collecting highly sensitive health information from a series of participants. We have ethics approval already. …. we'll also get questions like — hey we want to use this cloud service — is that ok? And then we'll work together with them to figure out within university policy, health legislation, privacy legislation — is that ok." (Participant 2)

With increased emphasis on information systems for data storage many participants noted that their role now includes providing advice or services related to data security and partnership risk assessments.

"Finally, there's something called a security threat risk assessment. This um this is also a similar document to the security plan but instead of just describing the architecture, it also assesses it and comes up with a list of key risks and areas where mitigation would be recommended. It's commonly used by third parties to determine whether or not they feel the project is safe enough to do what they're planning to do." (Participant 2)

"….anything around helping with security requirements, architectural design, and sometimes sort of working together in more complicated situations where there needs to be. … data transfer, ownership questions, looking at policies and requirements and trying to gauge what architectural changes need to be made to the scope and the way the study has been set up in order to meet those requirements." (Participant 1)

Recruitment & Career Pathway

Participants learnt about positions, through institute websites or personal networks.

"With respect to the positions in research admin, we really rely heavily on our network. And I think that's what's so nice about research administration too that is, even though it's a growing field, it still is sort of somewhat small. …." (Participant 7)

"Advertise them [job positions] on Indeed and then of course they're on our career page. Sometimes they're up on LinkedIn. If I do see something good, I might push it out through the CARA website." (Participant 8)

When it came to understanding why participants chose this profession, most noted they entered by happenstance, either needing to change professions due to personal reasons or a lack of faculty positions. This fits well within a career path phenomenon that Susan K. Martin (1995) describes as an "accidental" profession, or more specifically "a profession populated overwhelmingly by people who discovered it while detouring from some other planned career."

"Yeah so, I did not set out to have a job in research administration. I think, like many other people, I didn't really even know what it was. …but when I did my Master's program, there was sort of an internship component. And I ended up doing my internship in sort of a technology transfer role, which was research admin, but I didn't know it was research admin at the time." (Participant 7)

"I'm going to start out by saying that I didn't pursue this career. I was a tenured … at a different institution, had to move for personal reasons and did not want to spend the rest of my career being a part-time professor …. So, I decided that I had to do something different. Um this randomly happened to come up. Somebody sent me the job ad and I applied for it and here I am …." (Participant 2)

"…a very convoluted path. I started out in the academic fields … I did a bachelor's degree in

biology … master's degree in biochemistry … got into more of the clinical field through my research … so started working in a hospital-based research institute. I started working as a research coordinator and developed a fair number of skills for research support." (Participant 10)

A common theme that also emerged from participants that sought RMA roles was that they felt the profession would allow them to make a valuable contribution to society and more specifically within the healthcare sector.

"I started out in the private sector. So, I was in pharmaceuticals and biotech and then I went to the agency side …. don't know if I want to be selling these solutions to pharma anymore. It just started to feel a bit, for me, a bit icky. It was like, you know, sometimes you'd be like spending hundreds of thousands of dollars on these solutions which were amazing. But then I thought, couldn't patients better benefit from this if we were able to funnel the money elsewhere. So anyways I decided at that point I was done, and I wanted to go a different path, and I wanted to go public sector …." (Participant 4)

Most respondents identified as women. Roles in RMA may be more attractive than faculty/ scientist roles because they allow for greater accommodation for childcare and family commitments. 'Family' was a theme that came up frequently in interviews as a reason to become an RMA. As a high percentage of respondents were women, it is possible that RMA roles may have less incidence of unconscious bias in hiring/promotions, thus more women in leadership positions serving as role models and mentors.

"Just from a family perspective I didn't have the possibility to easily move elsewhere where I might have applied for positions [research, academia]." (Participant 5)

"… did two post docs after that and it was during my second post doc that … I moved back to …, which is where I'm from, but had lived away for 15 years. My husband and I had a child, and we wanted to be closer to grandparents. So, we made the decision…." (Participant 4)

When it comes to recruitment and equity, diversity and inclusion (EDI), like many sectors within higher education in Canada, participants noted that their institutions have implemented EDI policies to support recruitment of employees from equity deserving groups.

"…. So, like when we get applications, if somebody self identifies um then we separate those, and we make sure to interview the top two candidates in that. Um potentially more of course, but at the very minimum, at least the top two candidates from anyone who has self-identified." (Participant 6)

"…actually, we have on our own plan, to create an EDI action plan. … I know HR is part of that ensuring that there's EDI within our hiring practices." (Participant 2)

However, most participants acknowledged that there were still large gaps related to EDI in the hiring process leading to lack of diversity in the RMA workforce.

"Our institution will accommodate, but… it's just not there yet. It's a little bit talking about it, but it's not really doing … we just added a statement maybe in the last three months that says — if you need accommodations for an interview, we'll meet them." (Participant 8)

"…there's a significant gap that needs to be addressed, which is that we don't actually have an EDI policy." (Participant 10)

"I think it's just a gap that we don't know enough. Like I feel like um even our interview questions potentially should be overhauled and have more of an EDI lens." (Participant 4)

".... The big thing that I have noticed in terms of a gap is that um EDI is often understood here as referred to white women and not more encompassing. So that's something that I think does need to be addressed, um yeah." (Participant 2)

When it came to providing suggestions on how to improve EDI, participants felt that EDI by design led by institutional strategic goal setting would support diversification of the RMA workforce.

"... and I think that there's still gaps in terms of ... making sure that we're building it in right from the beginning, kind of like that privacy by design method in research where it's like EDI by design." (Participant 7)

Education

Given the broad scope of duties, the education pathways varied greatly from those holding undergraduate degrees to those with doctoral degrees. However, one pattern that emerged is that participants currently in Senior level roles noted that they started their career with an undergraduate degree or a Master's degree and gained critical skills and additional credentials as they progressed. By contrast, Early career participants noted that they entered into their career already holding a Master's or a PhD degree and that they gained skills to build competencies such as management, conflict resolution, and issues related to EDI in research from the onset of their current roles. However, it was evident the views on what the required education level should be for various areas of RMA differed greatly based on participants' actual education pathways into the profession. It was commonly acknowledged that having some training or undersetting of research was critical. More than one participant indicated a big part of their job was having faculty trust them, and that was helped by having a PhD.

"I do think it is valuable when people in research administration can at least have a background in academic research or some form of research. Where they have at least developed those kind of analytical skills and the problem-solving skills that you require to kind of design and execute a research project." (Participant 10)

"It is useful to have a PhD and to have that research experience ... you're someone who has been where they have been (professors) so they know you understand their perspective as well. They don't see you solely as an administrator." (Participant 5)

"... because you're working with faculty who all have Ph.Ds ... you want to be able to relate to them at an equal level. You're giving them advice ... they need to be able to see you as someone with ... at least the same level of education who can make their way and understand their research project." (Participant 9)

"Uh I definitely think an undergraduate degree that involves some type of research is important. Um just to kind of have that understanding from the researcher perspective ... I don't think it really matters whether you have a humanities background or a life-sciences background or a physical-sciences ... I do think my Masters helped me um in my role...." (Participant 7)

"And certainly, there's a recognition that the work that I do and the value that I provide comes with having done a Ph.D. That's not to say that everybody

who does research administration needs a Ph.D. But if you're going to provide the level of oversight, um and have sort of that deep understanding of the proposal process and the in and outs of sort of the academic environment, then a Ph.D. is super valuable." (Participant 6)

"…. For a contracts background I think it depends on the institution. Some look for legal credentials and some don't … as somebody without legal credentials, I don't really think it's necessary …." (Participant 7)

Skills

The primary skills participants felt were essential to the role included project management, critical thinking, exemplary writing, strategic planning, and diplomatic communication skills.

"…think, you know, high critical thinking, strong reading, strong writing…." (Participant 2).

"There's also the need to be diplomatic. You're dealing with a lot of different personalities, a lot of strong personalities in the academy and you're trying to tell them how to write better (laughter). So you have to know how to package that in a way that lands with them so that they're amenable to taking your feedback into consideration. …. So strong communication skills, including being diplomatic." (Participant 6)

Additionally, for participants in the research data management field, a risk management mindset was deemed critical.

"…. Because a lot of these things are best done with a risk-based approach. So, understanding enterprise and IT risk also plays into it a lot. But I think taking risk-based approach to research projects also has merit. So, understanding how that fits in another area." (Participant 1)

Incentives

On the whole, participants felt that the RMA profession was well paid, and the benefits offered were attractive and this contributed to recruitment and retention within the profession.

"…. Compensation is fair, very fair I would say. …. You're on the grid and then they're really transparent about where you are, why you're there and how you will move forward." (Participant 6)

"… really good for retention, there is a, what they refer to as a general wage increase that's baked into our employment contract. And that's basically looking at inflation and trying to match inflation…" (Participant 1)

"Flexible so in terms of work hours … only obligation is that one day and then it's entirely their choice. Flexibility … ability of the organization to provide good salaries, which they have, insurances and all these things. I think overall that people are satisfied from that perspective." (Participant 5)

Career Goals

Participants viewed next steps in their career as moving from support and advising to more senior management roles such as senior research officer, research director, or moving into specialized fields such as data security and risk management.

"I'm looking at currently applying to do an MBA next year. Just to get the skills, the management skills in order to apply for management jobs…" (Participant 2).

"So, I'm doing risk assessments for my department, for the institution and for the digital research alliance of Canada. So given that that cropped up, it seemed like the next logical thing..." (Participant 1)

A common theme was that many felt it was difficult to advance their career beyond their current positions.

"My immediate supervisor is a researcher ... it's a professor position .... And so, I think that that's kind of limiting ... for me to progress, I would have to go maybe sideways and go in a bigger university and have a similar position." (Participant 5)

"I think with this Grants Facilitation role at our university is that it's a ceiling.... There's no advancement unless you want to leave your faculty and go into the institution level. But even there ... they're at the same band level. It would just be a sideways movement." (Participant 9)

Finally, when asked what opportunities or professional development they need for career advancement, participants suggestions including networking, mentorship, skills development workshops, and volunteering were offered as desirable as opposed to higher education or certification programs.

"Um and yeah, some type of mentorship would be very helpful .... And so even though the institution is growing, um it's sort of being able to figure out how you can present an opportunity for maybe a new role and getting guidance on how to do that." (Participant 7)

"I would love to be mentored by an AVP or VP of Research at some other institution. And I would love executive coaching. I actually have asked for executive coaching and that's been approved, so I'm starting that." (Participant 8)

"I guess maybe just to sort of expand a little bit more, I know I talked about how important networking is, but I really emphasize that again. ... going for opportunities ... asking for professional development opportunities. And I was able to actually go to a conference, which I know it will depend on the institution, but really networking there (was helpful)." (Participant 7)

".... Doing any sort of volunteering that you can I think has been absolutely critical...." (Participant 1)

".... Serving on some committees could be helpful. Um maybe, you know, taking any kind of appropriate CARA um webinars (workshops) that might come up...." (Participant 2)

CONCLUSION

Our study clearly shows that the field of RMA is a varied profession. Through the analysis of 120 job postings over a 10-month period, the Task Force documented that 55% (*n*=66) of the positions with publicly listed salaries fell into the category of general research *administration* while 45% (*n*=44) fell into the category of research *development*. Within the administration category, duties typically included finance, human resources, contracts or research ethics oversight. Whereas the development role included duties related to seeking increased funding through grant development or institutional research strategy focused roles. The Career Task Force found striking differences when comparing education and experience level requirements between the two categories of RMA roles, yet the skills required for career progression, and career aspirations were very similar.

With respect to education and experience levels requirements, the environmental scan (Phase 1), showed that there was a clear distinction between research administration and research development roles for each category of RMA (Early, Mid and Senior level administrators). Although there was a general rise in salary across both categories as education demands for the positions increased, there was a greater abundance of research development job postings that required a Master's degree or PhD as an entry requirement compared with the research administrator job postings, which predominantly required a minimum of a Bachelor's degree. For research administrative roles, postings clearly expressed how an increase in work experience in the specific area of research administration (3 years for Early career roles, 3-5 years for Mid-level positions, and 5+ years' experience for Senior roles) would be the main driver for an administrator to progress through the Early to the Mid and/or Senior level job category postings as opposed to highlighting education as being a requirement for promotion.

As identified through our survey (Phase 2) and interview (Phase 3) data, many of those who identified as research administrators had education beyond their minimum job requirements, which may demonstrate that education is seen as an asset as opposed to a requirement for meeting the formal requirements of research administration roles. On the other hand, job postings revealed a noticeable mandate for both graduate degrees, and several years of work experience, to be held by candidates across all levels (Early, Mid and Senior level administrators) for research development job postings. More specifically, 50% of Early career research development positions required a Master's degree with over 3 years of work experience as the minimum job criteria. By contrast the Mid-career development positions required 18% of applicants to hold a Master's degree and 9% to carry a PhD, while Senior level roles required 58% of applicants to have Master's degree and up to 17% to hold a PhD. For Mid-career research development positions, 36% of the candidates required a minimum of four years of experience in comparison with 92% of Senior level roles that required a minimum of 5 years of work experience to meet the minimum job criteria.

One phenomenon uncovered by this study is that Early career research development participants had the highest number of PhDs, and therefore potentially had accelerated career paths in RMA. The information gathered from the study clearly highlighted that a Bachelor's or higher degree accompanied by work experience is needed to progress in the research administration career paths while a graduate level education (Master's or PhD) combined with work experience were the critical requirements for entry into research development. Seeking a graduate degree may furthermore be a tool for RMAs candidates who aim to successfully cross over from research administration to research development work. As experience was found to be such a valuable requirement for many of the Mid and Senior level positions in the environmental scan of job postings, developing skillsets through professional development like those offered by CARA may greatly assist candidates in demonstrating their qualifications for higher level roles in research administration and development.

Through the online survey (Phase 2), the Task Force gained insight into both participant perceptions of the skills they required to perform their job, and the skills they felt were critical to progressing in various roles across the RMA profession. The majority of participants indicated that Communication (64%), Attention to Detail (54%), Critical Thinking (35%), and Problem Solving (31%) skills were the top skills required by RMAs, and that Communication, Critical Thinking and Coordination skills were of chief importance across all career stages and career groups. These, consequently, are the primary skills RMAs possess and which aspiring RMAs should seek to develop in order to enter the profession. Survey respondents were also asked to highlight the skills that they wished that they could develop to assist them in their careers. In this area, the top indicated skills were Conflict Management (46%), Cultural Fluency (34%), Networking (33%), and Budgeting (32%). Many Early Career participants (53%) indicated that they would benefit from developing their

Finance skills—more precisely numerical, budgeting, and analytical skills, while Senior career participants (48%) felt that developing their Research skills—grant writing, technical, synthesizing information, and research abilities—would be most beneficial to them in furthering their careers. Communication skills rated highly in both categories as being both necessary skills and wished-for skills by RMAs, however, the specific skills for Cultural Fluency, Negotiation and Persuasion were selected more often as desired communication skills for further development and further career progression.

Related to skills and education, many participants in leadership roles revealed that they started their career with a Bachelor's or Master's degree as well as key skills required for success, and that they gathered additional education, skills and credentials necessary to develop their careers along the way. In particular, leaders developed their conflict resolution, management and EDI skills as they progressed in their careers. RMAs also underlined the need for a risk management mindset and diplomatic approach to communicating with others as skills that helped them to succeed in their roles and interact with stakeholders. Some RMAs pursued MBAs as a means for developing skills to enter management. Notably, formal certifications did not feature highly as requirements for promotions in comparison with developing specific hands-on skills and competencies to be considered for more senior positions in a specific area of research administration. Having experience in research was found to be critical in supporting research for RMAs coming from all educational disciplines (Bachelor's degree, Master's or PhD), but the research experience from a PhD or postdoctoral role were highlighted as being especially valuable. In particular, this research background was found often to be a point of shared experience with faculty who trusted their RMAs with shared educational credentials more than someone without the same or similar level of academic experience. RMAs revealed that one of the most complicated obstacles in their career progression was that in some institutions, the top administrative roles in research were reserved for faculty members. By contrast, RMAs highlighted that they found their most helpful strategies for moving their career forward were networking, workshops and webinars, volunteering through service on committees, and mentorship opportunities, especially when executive mentorship opportunities might be found.

When asked if they felt their research administration organization could support skills development, 28.2% of interview participants indicated that they did not feel that their professional organization (CARA) could provide the resources for them to develop skills in the most needed areas. However, only 18.8% of participants surveyed noted having started or completed the CARA-designed Research Administration Certificate program offered through Mohawk College in Canada. Of these, 77% found this certificate program to support their needs, which is highly encouraging. Given this finding, the next phase of this study should focus on understanding why the uptake of the CARA certificate program is so low, and an evaluation and update to the certification programs content should be undertaken to ensure the critical skillsets identified by research administrators in this recent study are covered within the program syllabus. Additionally, providing a professional designation to those completing the program may improve uptake. A follow-up study should seek to understand any reservations that may be preventing CARA members from participating in the CARA certification program, as well what promotion strategies may improve CARA member participation in the program.

Finally, the interviews (Phase 3) provided us with an understanding of entry pathways into the RMA profession, and participant career aspirations. Many interview participants noted that they relied on publicly advertised job postings or recommendations from their personal networks to enter the profession. In every case, interviewees acknowledged that their entry into the profession was through an indirect pathway and by chance. A variety of reasons were provided for why participants were drawn to the profession. These included becoming aware that their existing skills (often from higher education degrees) were highly transferable to the RMA work, finding the salary and benefits to be attractive and appropriate to their long-term retention in the profession, and

an appreciation of the work-life benefits available to them through this alternate career path. Flexible work hours were underlined as a valuable factor in staff retention by RMAs. Notably, several participants highlighted the rewarding nature of the profession as they felt they could contribute to society through their daily work supporting research administration related to social, environmental and human health research programs. Female participants also revealed leadership aspirational motivations which they associated with the profession, in that they felt the RMA role might provide them more opportunities to transition into leadership roles compared with many other professions. In terms of areas of improvement, participants identified increased mental health supports for employees as being beneficial. RMAs also indicated that their institutions were still building capacity in EDI in that many of their institutions either did not have an EDI policy in place to help with hiring practices or that the policies were being newly implemented. This study confirmed our hypothesis that the profession lacked diversity.

This study complements the work of Kerridge and Scott (2018) in their Research Administration as a Profession (RAAAP) international survey by offering a Canadian lens to investigate the RMA profession to better understand the education and skills required to pursue and advance in the profession in Canada. To summarize, this study notes that 74.6% of survey respondents report holding a graduate degree, with many Early career RMA holding PhDs. Senior career stage administrators held the fewest PhDs overall compared to early and Mid-career administrators. Experience was also correlated to increased salary. RMAs with $100k+ salaries were found to be most likely to hold a senior role.

This study identified key skillsets needed for success and career progression. RMAs desire opportunities to develop Leadership skills, EDI, Budgeting and Cultural Fluency skillsets, but do not feel confident they may do so via existing CARA resources. CARA may consider building workshops and programs to support skill building related to the key needs identified from our survey (**Table 3**). Participants also indicated that executive coaching, mentoring, networking or volunteering opportunities would be helpful to advancing their careers. When hiring fellow colleagues into the profession, RMAs indicated that EDI practices and policies across the country vary and that there are gaps to be filled to address a lack of diversity in the workforce. Guidance on best practices and standards in EDI would be beneficial for institutions to consult when developing their hiring practices. Further research exploring the barriers and lived experiences of RMAs from equity deserving groups in the field would build on this study. Finally, future researchers may compare the training offered by the Japan Certification Board for Research Administration and Management Skills with our CARA certificate programs. It would be beneficial to see what training areas are recognized as useful by administrators elsewhere and build on CARA's trainings once we more fully understand gaps.

This study is unique in that the Career Path Task Force is made up largely of Canadian research administrators volunteering to study the profession in support of their fellow colleagues. The Career Path Task Force is especially grateful to the many research administrators who participated in surveys and interviews as well as all current and past members of the Career Path Task Force. Through the sharing of their personal information and stories of their career journeys, these participants helped to decode some of the profession's hidden requirements and varied paths for the benefit of their peers across Canada.

AUTHORS' NOTE

Correspondence concerning this article should be addressed to:

Jyoti Kotecha
Carbon to Metal Coating Institute, Queen's University, & Centre for Studies in Primary Care, Department of Family Medicine, Queen's University.

90 Bader Lane, Kingston, Ontario,
ON K7L 3N6, Canada.
kotechaj@queensu.ca

REFERENCES

Canadian Institute for Health Information. (2022). *Guidance on the use of standards for race-based and indigenous identity data collection and health reporting in Canada.* https://www.cihi.ca/sites/default/files/document/guidance-and-standards-for-race-based-and-indigenous-identity-data-en.pdf

Government of Canada. (2021, April 15). *Frequently asked questions about the Self-identification Questionnaire.* Self-Identification Data Collection in Support of Equity, Diversity, and Inclusion. https://science.gc.ca/site/science/en/interagency-research-funding/policies-and-guidelines/self-identification-data-collection-support-equity-diversity-and-inclusion/frequently-asked-questions-about-self-identification-questionnaire#11

Gupta, S. (2017). Ethical issues in designing internet-based research: Recommendations for good practice. *Journal of Research Practice, 13*(2), 1–14. http://jrp.icaap.org/index.php/jrp/article/view/576/476

Ito, S., & Takahashi, M. (2023). Key perspectives for a long-term career – Statistical analysis of international data for a new profession. In Kerridge, S., Poli, S. and Yang-Yoshihara, M. (Eds.), *The Emerald handbook of research management and administration around the world* (pp. 395-404). Emerald Publishing Limited.

Kerridge, S., & Scott, S. F. (2018). Research administration around the world. *Research Management Review, 23*(1), 1-34.

Kulakowski, E. (2023). The establishment and history of the International Network of Research Management Societies. In Kerridge, S., Poli, S. and Yang-Yoshihara, M. (Eds.), *The Emerald handbook of research management and administration around the world* (pp. 83-95). Emerald Publishing Limited.

Martin, S. K. (1995). The accidental profession: Seeking the best and brightest. *The Journal of Academic Librarianship, 21*(3), 198-199.

Monahan, K., Shaklee, T. & Zornes, D. (2023). History of Research Administration/Management in North America. In Kerridge, S., Poli, S. and Yang-Yoshihara, M. (Eds.), *The Emerald handbook of research management and administration around the world* (pp. 27-36). Emerald Publishing Limited.

Oliveira, C., Fischer, M., Kerridge, S., & Dutta, M. (2023). The Research Administration as a Profession (RAAAP) Survey. In Kerridge, S., Poli, S. and Yang-Yoshihara, M. (Eds.) *The Emerald handbook of research management and administration around the world* (pp. 113-123). Emerald Publishing Limited.

Olzmann, J. A. (2020). Diversity through equity and inclusion: The responsibility belongs to all of us. *Molecular Biology of the Cell, 31*(25), 2757-2760. https://doi.org/10.1091/mbc.E20-09-0575

Ruzycki, S. M., & Ahmed, S. B. (2022). Equity, diversity and inclusion are foundational research skills. *Natural Human Behaviour, 6,* 910–912. https://doi.org/10.1038/s41562-022-01406-7

Statistics Canada. (2023, May 2). *Canadian Income Survey, 2021.* The Daily. https://www150.statcan.gc.ca/n1/daily-quotidien/230502/dq230502a-eng.htm

Swartz, T. H., Palermo, A. S., Masur, S. K., & Aberg, J. A. (2019). The science and value of diversity: Closing the gaps in our understanding of inclusion and diversity. *Journal of Infectious Diseases, 220*(Suppl 2), S33-S41. https://doi.org/10.1093/infdis/jiz174

University of Tokyo. (2014). Research administration skill standards (Japanese).

Virágh, E., Zsar, V., & Balázs, Z. (2019, March). *Research Management and Administration: A profession still to be formalized: HETFA Discussion Paper supporting the framing and conceptualization of an educational programme for Research Managers and Administrators.* HÉTFA Research Institute and Center for Economic and Social Analysis. https://doi.org/10.13140/RG.2.2.23699.09765

Zink, H. R., Hughes, D., & Vanderford, N. L. (2022). Reconfiguring the research administration workforce: A qualitative study explaining the increasingly diverse professional roles in research administration. *Journal of Research Administration, 53*(2), 119-140.