Burnout and Its Correlates in Research Administrators

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ABSTRACT

Aim: To identify the prevalence and correlates of burnout among research administrators.
Background: Research administration is characterized by increasing government regulation, hyper-competitiveness, institutional management of growing complexity, and changing economic conditions. However, there is a lack of research on burnout among research administrators.
Methods: A cross-sectional survey was conducted among 2,416 research administrators from four associations in Australia, Canada, the U.K, and the U.S. between October 2018 and January 2019. An online questionnaire was used for data collection. Burnout and workplace factors were measured using the Copenhagen Burnout Inventory and Copenhagen Psychosocial Questionnaire II. respectively.
Results: The prevalence of high personal burnout, work-related burnout, and client-related burnout was 68.3%, 60.0%, and 37.0%, respectively. Gender, considered leaving the profession, average working hours/week, self-rated health, job satisfaction, quantitative demands, tempo (work pace), influence at work, predictability, recognition, role clarity, quality of leadership, work-family conflict, justice and respect, vertical trust, threats of violence, and bullying were associated with all three forms of burnout among research administrators.
Conclusion: Burnout is common among research administrators. Research organizations are responsible for providing healthy work environments to ensure positive client, research administrator, and organizational outcomes. Future research is required to examine workplace approaches to improving the psychosocial work environment.

INTRODUCTION

Research administration and management (hereinafter referred to as research administration) is a field characterized by increasing government regulation, hyper-competitiveness (The Research Universities Futures Consortium, 2012), institutional management of growing complexity, and changing economic conditions (Tauginiene, 2009). However, the impact of these characteristics on the psychological and occupational functioning of research administrators (RAs) is not well understood due to lack of research. To our knowledge, only two published studies have investigated occupational stress in research administrators (Katsapis, 2012; Shambrook, 2012).

Shambrook (2012) compared the responses from 2007 and 2010 Research Administrator Stress Perception Surveys (RASPerS)—random surveys of RESADM-L listserve subscribers. The study found significant differences between the responses from the 2007 and 2010 surveys; perceived work stress, numbers of hours worked, work/family conflict, and sickness presenteeism (reporting to work when sick) were all significantly higher in 2010. Katsapis (2012) explored types of stressors self-reported by university research administrators (URAs). She found that role ambiguity was associated with debilitating strain, while role overload was associated with mild levels of stress and strain.

Burnout is defined by the World Health Organization (WHO) as a syndrome conceptualized as resulting from chronic workplace stress that has not been successfully managed. It is characterized by three dimensions: (1) feelings of energy depletion or exhaustion; (2) increased mental distance from one's job, or feelings of negativism or cynicism related to one's job; and (3) reduced professional efficacy. Burn-out refers specifically to phenomena in the occupational context and should not be applied to describe experiences in other areas of life (ICD-11; https://icd.who.int/en/).

A recent systematic review by Salvagioni et al. (2017) showed that burnout is a significant predictor of a variety of adverse physical, psychological, and occupational outcomes. Specifically, physical outcomes included hypercholesterolemia (elevated cholesterol), type 2 diabetes, coronary heart disease, hospitalization due to cardiovascular disorder, musculoskeletal pain, prolonged fatigue, headaches, gastrointestinal issues, changes in pain experiences, respiratory issues, severe injuries, and mortality below the age of 45 years. Psychological outcomes include insomnia, depressive symptoms, use of psychotropic and antidepressant medications, and hospitalization for mental disorders. Workplace outcomes included job dissatisfaction, absenteeism, and presenteeism.

It is reasonable to consider that burnout may be an unintended consequence of organizational responses to the current highly demanding research operating environment, with significant negative consequences for delivering research strategy, and therefore an important consideration for organizations as they seek to align research administrative functions with over-arching research strategy. A compromised research administrative workforce could, for example, lead to a failure to disseminate funding opportunities in a timely and targeted manner, incorrect costings for applications or commercial contracts, flawed contracts, and consequent loss of research income and stakeholder goodwill.

For individual RAs, burnout could potentially lead to a variety of negative outcomes (individual, interpersonal, and organizational), including but not limited to: reduced motivation, reduced productivity, increased sick days, failure to participate in strategic activities, failure to undertake professional development, and workplace conflict. No published peer-reviewed studies have explored burnout in RAs, and to the best of our knowledge, this is the first international study to examine the prevalence of high burnout in RAs. In addition, this will be the first study to explore the relationship between individual and psychosocial work environment factors, and burnout in RAs.

In the early 2000s, the National Research Centre for the Working Environment (NRCWE; Denmark) developed a theoretical framework through its PUMA (Project on Burnout, Motivation and Job Satisfaction) and PRISME (Psychosocial risk factors in the working environment and biological mechanisms for the development of stress, burnout and depression) longitudinal studies. In the PUMA study, Borritz et al. (2006a) examined the determinants and consequences of burnout (Borritz et al., 2005; Borritz et al., 2010; Borritz, Rugulies, Christensen, Villadsen, & Kristensen, 2006b). The determinants included the psychosocial work environment (consisting of client-related and non-client-related factors), job characteristics, sociodemographic factors, social relations, lifestyle, and personality. The consequences were job dissatisfaction, intention to quit, job turnover, absenteeism, early retirement, morbidity and mortality.

This study is guided by these two lines of intersecting work and adopted the theoretical framework proposed by Borritz et al. (2006a) for the PUMA study (Borritz et al., 2005; Borritz et al., 2010; Borritz et al., 2006b) to investigate the prevalence of high burnout, and its association with psychosocial work environment risk factors in RAs.

MATERIALS AND METHODS

Study Design and Participants

A cross-sectional study was conducted with RAs from four research administration associations including: (1) Association of Research Managers and Administrators (ARMA) in the U.K.; (2) Australasian Research Management Society (ARMS); (3) Canadian Association of Research Administrators (CARA); and (4) National Council of University Research Administrators (NCURA) in the U.S. between October 2018 and January 2019. A link to access an anonymous online questionnaire hosted through Qualtrics was sent to all members of these associations (n=13,900). At the beginning of the questionnaire, participants were provided with information about the study and were asked to confirm their agreement to participate. The link was live for 16 weeks to allow enough time for completion. A series of three reminders was sent over the 16-week data collection period. Participation was voluntary and no incentives were provided.

Variables and Measurements

Self-reported demographic and job-related characteristics included member association, age, gender, highest educational qualification, employment type, role type, average hours/week worked in the last two weeks, years employed in research administration, and intent to leave in the last 12 months. Participants also reported their job satisfaction as "very satisfied", "satisfied", "unsatisfied", or "very unsatisfied" and general health as "excellent", "very good", "good", "fair", or "poor".

Copenhagen Burnout Inventory

The Cognitive Burnout Inventory (CBI) (Kristensen et al., 2005a) is comprised of 19 items measuring physical and psychological fatigue and exhaustion in three domains: (1) personal burnout (generic scale 6 items), (2) work-related burnout (7 items), and (3) client-related burnout (6 items). Items are rated on 5-point Likert scales ('Always'=100, 'Often'=75, 'Sometimes'=50, 'Seldom'=25 and 'Never/Almost Never'=0). Average scores for each scale were calculated and ranged between 0–100. Average scores of 50 or greater in each of the three scales indicate a high level of burnout with greater severity of fatigue and exhaustion. The CBI has good psychometric properties with Cronbach's alphas of 0.89, 0.89, and 0.87 for personal, work-related and client-related burnout, respectively (Chambers, Frampton, Barclay, & McKee, 2016). There is a growing body of research confirming the validity of the CBI as a screening tool for burnout (Chambers et al., 2016; Fong, Ho, & Ng, 2014; Milfont, Denny, Ameratunga, Robinson, & Merry, 2007).

Copenhagen Psychosocial Questionnaire II (short version)

The short version of the Copenhagen Psychosocial Questionnaire (COPSOQ-II) (Pejtersen, Kristensen, Borg, & Bjorner, 2010) was used to reduce response burden for the participants. The COPSOQ-II has been used to assess psychosocial conditions among physicians and nurses

(Ilić, Arandjelović, Jovanović, & Nešić, 2017), and hospitality workers (Ariza-Montes, Arjona-Fuentes, Han, & Law, 2018). The short version is comprised of 40 items measuring psychosocial work factors across 23 dimensions (scales) spanning five levels (individual, job, department, company and work-individual interphase). For this study, two items relating to the emotional demands scale, two items relating to the burnout scale, and two items relating to the stress scale have been removed as they are covered in the CBI. Most questions in COPSOQ-II have two items with five response options: either "always", "often", "sometimes", "seldom", "never/hardly ever", or "to a very large extent", "to a large extent", "somewhat", "to a small extent", "to a very small extent"). Scores on the five response items range from 0–4 so on 2-item dimensions the total score can range from 0–8, while 1-item dimensions range from 0–4. COPSOQ-II included four questions on exposure to offensive behaviour: (1) sexual harassment, (2) threats of violence, (3) physical violence, and (4) bullying. The following qualifying statement was used in the questionnaire to determine bullying: "Bullying means that a person repeatedly is exposed to unpleasant or degrading treatment, and that the person finds it difficult to defend himself or herself against it". Response items on the four questions were 'yes daily', 'yes weekly', 'yes monthly', 'yes a few times', and 'no'. However, these variables were used in analysis as binary.

Ethical Approval

Ethics approval was obtained from the University of Otago Human Ethics Committee Category B stream (D18/204).

Data Analysis

SPSS Version 25.0 was used for data analysis. Cronbach's alpha (α) was calculated for three CBI scales to evaluate internal consistency. Sample characteristics including gender, age, highest educational qualification, length of time working in research administration, member association, employment type, role type, job satisfaction, average hours worked per week in the last two weeks, considered leaving the profession, and self-reported health status were reported as a percentage. Each of the three burnout outcomes, i.e., personal, work-related, and client-related burnout, was analyzed separately. Prevalence of high burnouts defined as having scores of at least 50 was calculated for each outcome. General linear models were run to test associations between burnout with demographic and work-related factors. Bivariate models that included burnout with each sample characteristic and psychosocial work factor were performed and crude coefficients (95% CI) were reported. A multivariable model that included all sample characteristics was performed to test adjusted associations between burnout and sample characteristics. Associations between burnout and each

psychosocial factor adjusted for sample characteristics also were tested. Adjusted coefficients (95% CI) were reported for multivariable analyses. For multiple comparisons between groups of categorical variables, post-hoc tests with Bonferroni adjustment were conducted. All p-values were two-sided and considered significant if <0.05. As only a few participants experienced physical violence, associations between physical violence and burnout were not conducted, although prevalence was reported.

RESULTS

Cronbach's alphas for personal, work-related, and client-related burnout on the CBI were 0.897, 0.893, and 0.910 respectively. Cronbach's alphas for COPSOQ-II (short version) were 0.774 (quantitative demands), 0.857 (tempo/work pace), 0.650 (influence at work), 0.476 (possibilities for development), 0.896 (meaning of work), 0.694 (commitment to the workplace), 0.772 (predictability), 0.815 (recognition), 0.854 (role clarity), 0.823 (quality of leadership), 0.870 (social support from supervisors), 0.878 (work-family conflict), 0.794 (vertical trust – between management and employees), and 0.747 (justice and respect).

Demographic Characteristics of Participants

A total of 2,416 respondents began the questionnaire and 2,236 respondents completed all questions, providing a response rate of 17.4% (2,416/13,900). The sample characteristics are summarized in Table 1. Highly presented among respondents were women (82.3%), people aged 30–49 years (64.3%), people who worked full-time (89.8%), people who had a master's degree or doctorate (55.6%), people who had worked in research administration for 5 years or more (75.9%), and people who worked 40 hours a week or more (73.0%). The prevalence of high personal burnout (PB), work-related burnout (WRB), and client related burnout (CRB) was 68.3%, 60.0% and 37.0%, respectively.

Table 1.
Sample Characteristics

	n	%
Gender		
Male	433	17.7
Female	2012	82.3
Age Groups		
20–29	120	4.9
30–39	786	32.0
40–49	793	32.3
50–59	557	22.7
>60	202	8.2
Highest Qualification		
Bachelor/Below	915	37.0
Grad Certificate or Diploma	183	7.4

Masters/Ph.D.	1373	55.6
Employed as a Research Administrator		
<5 years	596	24.1
≥5 years	1873	75.9
Member Association		
ARMA	682	28.2
ARMS	642	26.6
CARA/other	263	10.9
NCURA	829	34.3
Employment Type		
Full-time	2220	89.8
Part-time/other	251	10.2
Considered Leaving the Profession		
No	1042	42.2
Yes	1429	57.8
Role Type		
Leader	360	14.6
Manager	1129	45.7
Operational/other	982	39.7
Average Hours per Week		
<35 hours	182	7.4
35-<40 hours	479	19.6
40-<45 hours	793	32.4
≥45 hours	994	40.6
Self-rated Health		
Excellent	209	9.1
Very Good	662	28.9
Good	902	39.4
Fair	434	19.0
Poor	80	3.5
Job Satisfaction		
Very Satisfied	338	14.8
Satisfied	1298	56.8
Unsatisfied	551	24.1
Very Unsatisfied	100	4.4
Personal Burnout		
High	1605	68.3
Low	745	31.7
Work-related Burnout		
High	1410	60.0
Low	940	40.0
Client-related Burnout		
High	870	37.0
Low	1480	63.0

Association between Sample Characteristics and Burnout

Table 2 shows associations between PB, WRB, and CRB, with sample characteristics. On average, after adjusting for other sample characteristics, female respondents had higher scores for PB (5.1 points) and WRB (3.9 points) but lower

scores for CRB (-3.5 points) than males (p-values<0.01). Although age was not associated with PB or WRB, RAs aged 40–49, 50–59, or ≥60 years had -6.0 points, -6.8 points, and -9.9 points, respectively lower scores for CRB than those aged 20–29 (p-values<0.05). No significant differences were found between RAs aged 30–39 and those aged 20–29 years across all three forms of burnout. RAs who held a bachelor's degree or below had higher scores for CRB (2.8 points) than RAs with a Masters/PhD (p-value<.01). RAs who had worked five years or more had higher scores for PB (2.7 points) and WRB (1.7 points) than RAs who had worked fewer than five years (p-values<0.05). ARMA, ARMS, and CARA members all had lower CRB scores than NCURA members—4.3, -6.4, and - 5.3 points, respectively. RAs who had considered leaving the profession had higher scores for PB (5.7 points), and much higher WRB (9.3 points) and CRB (9.3 points) than RAs that had not considered leaving (p-values<0.001). RAs who worked on average 35–39 hours/week in the last two weeks had lower scores for PB (-5.1 points), WRB (-7.4 points), and CRB (-3.3 points) than RAs who worked more than 44 hours/week in the last two weeks (p-values<0.05). Self-rated health status and job satisfaction were significantly negatively associated with PB, WRB, and CRB. For every point increase in self-rated health status score, there was a 7.6-point decrease in PB, 5.8-point decrease in WRB, and a 3.6-point decrease in CRB (p-values<0.001) and for every point increase in job satisfaction score there was a 6.3-point decrease in PB, 9.8-point decrease in WRB and an 8.5-point decrease in CRB (p-values<0.001).

Association between psychosocial work environment factors and burnout

Table 3 shows associations between psychosocial work environment factors and PB, WRB, and CRB. On average, after adjusting for sample characteristics, quantitative demands, tempo (work pace), predictability, recognition (rewards), role clarity, quality of leadership, work-family conflict, justice and respect, and vertical trust scores were associated with all three forms of burnout. For every point increase in quantitative demands (high workloads), there was a 1.8-point increase in PB, 2.5-point increase in WRB, and 1.5-point increase in CRB (p-values<0.001). For every point increase in tempo (work pace), there was a 2.4-point increase, 3.2-point increase, and 1.7-point increase in PB, WRB, and CRB scores, respectively (p-values<0.001). For every point increase in work/family conflict, there was a 4.3-point increase for PB, 5.5-point increase for WRB, and 2.5-point increase in CRB (p-values<0.001).

In contrast, for every point increase in influence at work, there was a 1.4-point decrease for PB, 1.6-point decrease for WRB, and 1.2-point decrease in CRB (p-values<0.001). For every point increase in predictability, there was a 1.2-point decrease in PB, 1.6-point decrease in WRB, and 1.7-point decrease in CRB (p-values

Table 2
Regression Coefficients (95%CI) for Associations between Burnout and Sample Characteristics

		Model 1§			Model 2 (*n*=2186)‡		
	n	PB	WRB	CRB	PB	WRB	CRB
Female vs. Male	2,324	5.8 (3.8, 7.8)***	4.1 (2.0, 6.2)***	-2.7 (-5.0, -0.3)*	5.1 (3.5, 6.8)***	3.9 (2.3, 5.6)***	-3.5 (-5.6, -1.5)**
Age Group (years)	2,338						
30–39 vs. 20–29		7.2 (1.8, 12.7)**	5.3 (-0.4, 11.1)	2.0 (-4.3, 8.4)	1.1 (-3.5, 5.7)	-1.2 (-5.8, 3.3)	-2.9 (-8.7, 2.9)
40–49 vs. 20–29		7.0 (1.6, 12.5)**	5.7 (-0.1, 11.4)	-1.0 (-7.3, 5.3)	-1.0 (-5.7, 3.7)	-2.2 (-6.9, 2.4)	-6.0 (-11.9, -0.1)*
50–59 vs. 20–29		4.2 (-1.4, 9.7)	3.7 (-2.2, 9.5)	-1.9 (-8.4, 4.6)	-2.6 (-7.5, 2.3)	-3.1 (-7.9, 1.7)	-6.8 (-12.9, -0.6)*
≥60 vs. 20–29		1.5 (-4.8, 7.9)	1.4 (-5.3, 8.1)	-5.2 (-12.5, 2.2)	-4.2 (-9.7, 1.3)	-4.5 (-9.9, 0.9)	-9.9 (-16.8, -3.1)**
Highest Qualification	2,350						
Bachelor/Below vs. Masters/Ph.D.		0.9 (-1.1, 2.9)	0.5 (-1.6, 2.6)	3.2 (0.9, 5.5)**	0.8 (-0.9, 2.5)	0.7 (-0.9, 2.3)	2.8 (0.7, 4.9)**
Postgraduate Cert or Diploma vs. Masters/Ph.D.		5.0 (1.3, 8.7)	4.4 (0.6, 8.3)*	2.5 (-1.8, 6.8)	1.9 (-1.2, 5.0)	1.6 (-1.5, 4.6)	1.8 (-2.1, 5.7)
Years Employed (≥5 vs. <5 years)	2,348	3.1 (1.3, 4.9)**	3.2 (1.3, 5.0)**	1.7 (-0.4, 3.8)	2.7 (1.0, 4.3)**	1.7 (0.9, 3.4)*	2.0 (-0.1, 4.1)
Member Association	2,298						
ARMA vs. NCURA		4.8 (2.1, 7.4)***	3.1 (0.4, 5.9)*	0.5 (-2.5, 3.6)	1.0 (-1.3, 3.3)	-0.2 (-2.5, 2.1)	-4.3 (-7.2, -1.4)***
ARMS vs. NCURA		3.7 (1.1, 6.4)**	2.0 (-0.9, 4.8)	-2.8 (-5.9, 0.3)	0.6 (-1.79, 2.92)	-0.9 (-3.18, 1.47)	-6.4 (-9.32, -3.40)***
CARA/Other vs. NCURA		1.8 (-1.8, 5.5)	0.4 (-3.5, 4.2)	-5.2 (-9.4, -1.0)**	1.9 (-1.1, 4.9)	1.2 (-1.8, 4.1)	-5.3 (-9.0, -1.5)**
Employment Type (part time/others vs. full time)	2,350	1.6 (-1.0, 4.1)	-1.9 (-4.6, 0.8)	-1.6 (-4.5, 1.4)	0.1 (-2.9, 3.1)	-2.9 (-5.9, 0.0)	3.2 (-0.6, 6.9)

Considered Leaving the Profession (yes vs. no)	2,350	14.2 (12.7, 15.6)***	18.7 (17.2, 20.1)***	16.5 (14.8, 18.2)***	5.7 (4.3, 7.2)***	9.3 (7.9, 10.7)***	9.3 (7.5, 11.1)***
Role Type	2,350						
Manager vs. Leader		1.7 (-1.1, 4.5)	0.8 (-2.2, 3.7)	4.0 (0.7, 7.3)*	-0.08 (-2.4, 2.3)	-0.94 (-3.2, 1.4)	2.48 (-0.4, 5.4)
Operational/Others vs. Leader		0.8 (-2.1, 3.6)	-0.7 (-3.7, 2.3)	3.1 (-0.3, 6.4)	-0.4 (-3.0, 2.1)	-1.8 (-4.4, 0.7)	1.3 (-1.9, 4.5)
Average Hours per Week, in the last two weeks	2,328						
<35 vs. >44 hours		-2.3 (-6.4, 1.8)	-6.5 (-10.8, -2.3)***	-6.3 (-11.1, -1.5)**	-4.9 (-9.6, -0.2)*	-5.5 (-10.2, -0.9)*	-7.8 (-13.7, -1.9)**
35-39 vs. >44 hours		-6.1 (-9.0, -3.3)***	-8.7 (-11.6, -5.7)***	-5.0 (-8.3, -1.7)***	-5.1 (-7.6, -2.6)***	-7.4 (-9.9, -4.9)***	-3.3 (-6.5, -0.2)*
40-44 vs. >44 hours		-5.3 (-7.7, -2.9)***	-6.5 (-9.0, -4.0)***	-3.8 (-6.6, -1.0)**	-4.0 (-6.0, -1.9)***	-4.9 (-6.9, -2.9)***	-3.2 (-5.8, -0.7)**
Self-rated Health Status Score	2,287	-9.9 (-10.6, -9.2)***	-9.3 (-10.0, -8.5)***	-6.3 (-7.2, -5.4)***	-7.6 (-8.3, -6.9)***	-5.8 (-6.5, -5.1)***	-3.6 (-4.4, -2.7)***
Job Satisfaction Score	2,287	-11.5 (-12.5, -10.5)***	-15.1 (-16.0, -14.2)***	-13.0 (-14.1, -11.9)***	-6.3 (-7.3, -5.3)***	-9.8 (-10.8, -8.8)***	-8.5 (-9.8, -7.3)***

§ Bivariate models

ǂ Models with all sample characteristics included

*p<0.05, **p<0.01, ***p<0.001

PB: Personal Burnout; WRB: Work-related Burnout; CRB: Client-related Burnout

Table 3

Regression Coefficients (95%CI) for Associations between Burnout and Psychosocial Workplace Factors

	Model 1 (*n*=2,287)§			Model 2 (*n*=2,186)ǂ		
	PB	WRB	CRB	PB	WRB	CRB
Quantitative Demands	3.6 (3.2, 4.0)***	4.5 (4.1, 4.9)***	3.0 (2.5, 3.4)***	1.8 (1.5, 2.2)***	2.5 (2.2, 2.9)***	1.5 (1.1, 2.0)***
Tempo (work pace)	3.8 (3.3, 4.3)***	4.8 (4.3, 5.2)***	2.7 (2.1, 3.2)***	2.4 (2.1, 2.8)***	3.2 (2.8, 3.6)***	1.7 (1.2, 2.2)***

Influence at Work	-3.4 (-3.8, -3.0)***	-4.1 (-4.6, -3.7)***	-3.4 (-3.9, -2,9)***	-1.4 (-1.8, -0.9)***	-1.6 (-2.0, -1.2)***	-1.2 (-1.7, -0.6)***
Possibilities for Development (skill discretion)	-1.8 (-2.3, -1.3)***	-2.2 (-2.8, -1.7)***	-2.4 (-3.0, -1.8)***	0.2 (-0.3, 0.7)	0.3 (-0.2, 0.7)	-0.4 (-1.0, 0.2)
Meaningful Work	-1.9 (-2.4, -1.5)***	-2.7 (-3.1, -2.2)***	-3.9 (-4.4, -3.5)***	0.4 (-0.0, 0.8)	0.16 (-0.2, 0.7)	-1.87 (-2.4, -1.2)***
Commitment to the Workplace	-3.2 (-3.6, -2.9)***	-4.3 (-4.7, -3.9)***	-4.2 (-4.6, -3.7)***	-0.3 (-0.8, -0.1)	-0.8 (-1.2, -0.4)***	-1.4 (-1.9, -0.9)***
Predictability (sufficient information)	-3.7 (-4.1, -3.3)***	-4.6 (-5.0, -4.2)***	-4.1 (-4.6, -3.6)***	-1.2 (-1.6, -0.8)***	-1.6 (-2.0, -1.2)***	-1.7 (-2.2, -1.3)***
Recognition (rewards)	-3.8 (-4.2, -3.5)***	-4.68 (-5.1, -4.3)***	-3.6 (-4.1, -3.2)***	-1.5 (-1.8, -1.1)***	-1.7 (-2.0, -1.3)***	-1.2 (-1.7, -0.7)***
Role Clarity	-2.9 (-3.3, -2.5)***	-3.6 (-4.0, -3.2)***	-3.2 (-3.7, -2.7)***	-0.5 (-0.9, -0.1)*	-0.6 (-0.9, -0.2)**	-0.7 (-1.2, -0.3)**
Quality of Leadership	-2.5 (-2.8, -2.2)***	-3.3 (-3.6, -2.9)***	-2.4 (-2.8, -2.0)***	-0.4 (-0.7, -0.1)*	-0.7 (-1.0, -0.4)***	-0.4 (-0.8, -0.0)*
Social Support from Supervisors	-2.1 (-2.4, -1.7)***	-2.7 (-3.1, -2.4)***	-1.9 (-2.3, -1.5)***	-0.4 (-0.9, -0.1)*	-0.5 (-0.8, -0.2)**	-0.2 (-0.6, 0.2)
Work-Family Conflict	6.6 (6.2, 6.9)***	8.0 (7.6, 8.3)***	5.0 (4.5, 5.4)***	4.3 (3.9, 4.7)***	5.5 (5.1, 5.9)***	2.5 (1.9, 3.0)***
Vertical Trust	-3.4 (-3.8, -3.0)***	-3.9 (-4.3, -3.5)***	-3.3 (-3.8, -2.9)***	-1.0 (-1.4, -0.6)***	-0.9 (-1.3, -0.5)***	-1.0 (-1.5, -0.5)***
Justice and Respect	-3.9 (-4.3, -3.5)***	-4.8 (-5.2, -4.4)***	-3.8 (-4.2, -3.3)***	-1.1 (-1.5, -0.7)***	-1.4 (-1.8, -1.0)***	-1.2 (-1.7, -0.7)***

§ Bivariate models

ǂ Models adjusted for sample characteristics

*p<0.05, **p<0.01, ***p<0.001

PB: Personal Burnout; WRB: Work-related Burnout; CRB: Client-related Burnout

<0.001). For every point increase in recognition (rewards), there was a 1.5-point decrease in PB, 1.7-point decrease in WRB, and a 1.2-point decrease in CRB (p-values<0.001). For every point increase in quality of leadership, there was a 0.4-point decrease in PB, 0.7-point decrease in WRB, and 0.4-point decrease in CRB (p-values<.05). Role clarity also was negatively associated with PB, WRB, and CRB; for every point increase in role clarity score, there was a 0.5-point decrease in PB, 0.6-point decrease in WRB, and 0.7-point decrease in CRB (p-values<.01). For every point increase in vertical trust (trust in management), there was a 1.0-point decrease in PB, 0.9-point decrease in WRB, and 1.0 decrease in CRB (p-values<.001). For every point increase in justice and respect, there was a 1.1-point decrease in PB, 1.4-point decrease in WRB, and 1.2-point decrease in CRB scores (p-values<.001).

Social Support from supervisors was negatively associated with PB and WRB. For every point increase in social support from supervisors, there was a 0.4-point decrease in PB and 0.5-point decrease in WRB (p-values<.05). Commitment to the workplace was negatively associated with WRB and CRB, while meaningful work was only associated with CRB. For every point increase in commitment to the workplace, there was a 0.8-point decrease in WRB and a 1.4-point decrease in CRB (p-values<0.001). With one-point increase in meaningful work, CRB scores reduced 1.87 points (p<0.001). Possibilities for professional development was not associated with workplace burnout (p-values>0.05).

Exposure to Offensive Behaviors in the Last 12 Months and Association with Burnout

The prevalence of self-reported exposure to sexual harassment, threats of violence, physical violence, and bullying among RAs in the last 12 months was 3.8%, 1.9%, 0.4%, and 32.4%, respectively. Table 4 shows associations between PB, WRB, and CRB, with exposure to offensive behaviors. On average, after adjusting for other sample characteristics, RAs who had experienced sexual harassment had higher scores for WRB (4.5 points) and CRB (4.5 points) than RAs who had not (p-values<0.05). RAs who had experienced threats of violence had higher scores for PB (7.6 points), WRB (6.7 points), and CRB (8.9 points) than RAs who had not (p-values<0.01). RAs who had experienced bullying had higher scores for PB (3.3 points), WRB (3.1 points), and CRB (2.8 points) than RAs who had not (p-values<0.01).

DISCUSSION

Internationally, research organizations are facing unprecedented levels of government regulation, economic uncertainty, and hyper-competitiveness (The Research Universities Future Consortium, 2012; Tauginiene, 2009). This study was undertaken to determine the prevalence of PB, WRB, and CRB and their association with psychosocial work environment risk factors in RAs. Use of a

Table 4
Regression Coefficients (95%CI) for Associations between Burnout and Exposure to Offensive Behaviours

	Model 1 (*n*=2,287)§			Model 2 (*n*=2,186)ǂ		
	PB	WRB	CRB	PB	WRB	CRB
Sexual Harassment (yes vs. no)	8.5 (4.2, 12.9)***	10.7 (6.1, 15.3)***	9.4 (4.4, 14.5)***	3.1 (-0.4, 6.6)	4.5 (1.1, 8.0)*	4.5 (0.1, 9.0)*
Threats of Violence (yes vs. no)	13.1 (7.4, 18.7)***	14.2 (8.3, 20.1)***	13.7 (7.2, 20.2)***	7.6 (2.8, 12.3)**	6.7 (2.0, 11.4)**	8.9 (2.9, 14.9)**
Bullying (yes vs. no)	10.3 (8.7, 11.9)***	11.7 (10.0, 13.4)***	9.4 (7.5, 11.3)***	3.3 (1.9, 4.7)***	3.1 (1.7, 4.4)***	2.8 (1.1, 4.6)**

§ Bivariate models

ǂ Models adjusted for sample characteristics

*p<0.05, **p<0.01, ***p<0.001

PB: Personal Burnout; WRB: Work-related Burnout; CRB: Client-related Burnout

modified form of the Copenhagen Burnout Inventory to interrogate a sample of 2,416 RAs internationally, has produced a profile that may look very familiar to research administration leaders. We see a largely female-dominated workforce. Many RAs are in their 30s and 40s and well-educated, the majority having at least a master's qualification. Most have been working in research administration for five years or more, and a large majority work 40 hours a week or more. This profile is largely consistent with the profile of RAs in another study (Kerridge & Scott, 2018).

This study has shown that the high burnout was prevalent among RAs and that gender, considered leaving, average hours worked per week, self-rated health, job satisfaction, quantitative demands, tempo (work pace), influence at work, predictability, recognition, role clarity, quality of leadership, work-family conflict, justice and respect, and trust in management were all independently associated with all three forms of burnout. In a rapidly expanding profession, it is concerning to see the following trends.

Prevalence of PB (68.3%) and WRB (60.0%) was higher in this study than all other studies, while the prevalence of CRB (37.0%) in the Milfont et al. (2007) study was higher than the prevalence in this study. Chambers et al. (2016) (in their study with senior doctors and dentists) found the prevalence of high PB, WRB, and CRB were 50.1%, 42.1% and 15.7%, respectively. Milfont et al. (2007) reported prevalence rates of 43.0%, 41.5%, and 40.4% for PB, WRB, and CRB, respectively in secondary school teachers, while Borritz et al. (2006a) reported prevalence rates of 35.0%, 29.8%, and 26.3% for PB, WRB, and CRB, respectively, for employees in human service work. Several factors may have contributed to the higher prevalence found in this study. First, this study had a higher proportion of women than both the Chambers et al. (2016) and Milfont et al. (2007) studies, but a similar proportion to the Borritz et al. (2006a) study. Also, the proportion of respondents in this study endorsing 'fair' and 'poor' self-reported health (combined; 22.5%) was higher than that found in the Chambers et al. (2016) study (fair = 9.7% and poor = 1.2%), which may indicate the respondents in this study were in poorer health.

Planning to leave the profession is strongly associated with higher PB, WRB, and CRB. This suggests that burnout may be a driver of workplace departures. Nearly 60% of RAs indicated they considered leaving their job in the last 12 months. Although it is unknown whether these respondents had left a previous research administration role within the last 12 months or had initiated proceedings to resign from their current role. Further research is required to determine the job turnover rate and the reasons for leaving.

RAs working 44 hours or more per week had higher PB, WRB, and CRB. Working long hours, when combined with

the typical profile of an RA, would be an unsurprising contributor to burnout. Spending more time at work means less time for familial or social commitments, which may contribute to higher burnout scores. Organizations need to promote a culture of work-life balance to ensure better employee and organizational outcomes.

It is feasible to assume that RAs with higher self-reported health were able to cope more effectively with the challenges of being RAs, suggesting organizations may benefit from providing RAs with workplace initiatives that cultivate positive health (e.g. subsidized gym memberships, flexible work hours and work arrangements, subsidized health insurance). Equally important is providing organizational support for the most vulnerable RAs (e.g., Employee Assistance Programs or rapid access to occupational health services) and organizations could consider screening for common mental health issues in their workforce. Organizations will need to provide assurances around how this information will be managed, stored, and protected for staff to actively engage in the screening program.

Higher job satisfaction was associated with lower levels of PB, WRB, and CRB in RAs. A strong body of evidence demonstrates that healthy workplaces cultivate a range of positive employee and organizational outcomes. These include higher job satisfaction, higher productivity, higher commitment, improved resilience, improved retention, fewer accidents, improved 'brand', and reduced sickness (The Work Foundation, 2010). Provision of healthy workplace conditions may protect against higher levels of burnout, possibly through higher job satisfaction and reduced work stress. Further research is needed to determine the directionality of the relationship between job satisfaction and burnout.

RAs with five or more years of experience was associated with higher PB and WRB. It is possible that newly employed RAs are willing to endure the complexities and challenges of the role in order to prove themselves to their employers. However, the nature of the work over the long term may deplete the reserves of the most enthusiastic and loyal of employees, which may explain higher PB and WRB in RAs working beyond five years.

Female RAs had higher average scores for PB and WRB, but not CRB. This result may indicate that the physical and psychological fatigue, and exhaustion experienced by female RAs stems less from client contact (CRB) and more directly from their work (WRB) and non-work factors (PB). Female RAs, who form the majority of the research administration workforce, enjoy their dynamic place within the innovation system (talking with researchers and broader stakeholders about their work, problem solving, securing and managing funds that fit client needs, and so on, all higher order contributions), but some are

questioning whether they do this work in a less than supportive, even high pressure, work and personal setting compared with their male counterparts. Take, for example, work underway by Dr Sarah Tetley and Dr Helen Leech at the Research Services, University of Kent, to identify whether flexible working policies designed to accommodate the needs of people managing multiple work and life demands are in part contributing to the lower likelihood of female research managers occupying leadership roles. If so, what can be done to improve working conditions and work-life balance so that these people are less likely to experience burnout and continue to contribute at a high level? Men had higher CRB scores than women, which suggests men experience greater psychological fatigue and exhaustion stemming from interaction with clients.

Younger RAs (aged 20–29) had higher CRB than most older age groups but not PB and WRB. This indicates that younger RAs are struggling with the client-related aspects of their role, which may be attributed to their clients being older, more qualified, and more senior in the organization. Organizations may want to provide additional support for younger RAs, which may include workshops in effective communication, stress management, mentoring, and workplace coaching. A Gallup study of nearly 7,500 U.S. full-time employees found at least one in four 'millennials' (born between 1980 and 1996) reported feeling frequent or constant burnout at work, compared with one in five employees from older generations (Pendell, 2018). Further investigation is required to explore generational differences in burnout among RAs.

It also has been found that those taking RA positions with low education requirements may be more likely to experience CRB. RAs deliver services to very highly qualified specialists, with the most important clients often being at the top of their field. This result may suggest that there are significant challenges to operating as support personnel when there are differences in education level and/or topic knowledge. Research organizations need to provide opportunities for continued professional development and increasing workplace capability, such as subsidizing postgraduate education and allowing paid study leave.

PB, WRB, and CRB were not associated with role type (i.e., operational, manager, leader) nor were they associated with employment type (i.e., part-time/full-time). That all RAs would seem to be as likely to experience PB, WRB, and CRB and that there is no differentiation across functions or employment type, suggests that the contributors to burnout will be found in those factors that RAs share in common: the high volume, deadline-driven nature of the workplace and the need to manage substantial risk while at the same time supporting sometimes aggressive growth targets.

Essentially, some psychosocial work environment factors, in excess, exerted a negative effect on employee burnout levels, while other factors, at appropriate levels, exerted a positive or protective effect. Psychosocial work environment factors including quantitative demands (workload), tempo (work pace or work intensity) and work-family conflict (impact of work on private life), in excess, has been suggested to increase physical and psychological fatigue, and exhaustion in employees, which may result in burnout (Borritz et al., 2006a; Salvagioni et al., 2017). With respect to work-family conflict, working longer hours means RAs have less time for rest, family, and social commitments. A work-life balance is becoming increasingly important for both employees and the organizations they work for and having positive work-life balances can lead to positive employee and organizational outcomes (Cegarra-Leiva, Sánchez-Vidal, & Cegarra-Navarro, 2012; Haar, Russo, Suñe, & Ollier-Malaterre, 2014). The presence of influence at work (job control), predictability (i.e., being well informed of impending work environment changes), recognition (rewards), role clarity (i.e., knowing what is expected of you), leadership quality, vertical trust (trust in management), justice and respect (i.e., social capital), social support from supervisors, commitment to workplace, and meaningful work, independently, have been pointed to as lowering physical and psychological fatigue, and exhaustion, which can protect employees from developing burnout (Borritz et al., 2006a).

Furthermore, the magnitude of the association differed across work environment factors, with work-family conflict, work tempo, quantitative demands, influence at work, and recognition (rewards) providing the strongest associations. Although commitment to the workplace, social support from supervisors, quality of leadership, and role clarity were significantly associated with various types of burnout, the strength of associations in this study were relatively weak. Specifically, for weaker associations an increase or decrease of 0.2–0.8 points represented a less than 2% change on the burnout scales.

The results on WRB in this study confirm some of the findings from the study by Borritz et al. (2006a), who found a strong positive association between high quantitative demands and WRB. They also found a strong inverse association between job satisfaction and WRB. The results from this study are supported, in part, by research conducted by Andersen et al. (2017) involving prison guards. Andersen and his colleagues found a significant association between high quantitative demands and high level of burnout symptoms. They also found both low levels of work commitment and recognition were significantly associated with high levels of burnout symptomology. Further support is

provided by Ilić et al. (2017) in their study involving emergency care physicians and nurses. They found, after adjusting for several factors, that both influence at work and social support were significantly associated with WRB. The results from this study provided further support for the findings from a systematic review by Aronsson et al. (2017). Their review of 25 published studies showed low levels of job security, job control, recognition, and high workload elevated the risk of developing emotional exhaustion, while high levels of workplace justice and job support protected against emotional exhaustion.

The prevalence of offensive behaviors in this study differed from those in other studies. Exposure to sexual harassment in this study (3.8%) was slightly higher than in Pejtersen et al. (2010) (2.9%). The prevalence of exposure to threats of violence was lower in this study (1.9%) than in Pejtersen et al. (2010) (7.8%). Exposure to physical violence also was lower in this study (0.4%) than the Pejtersen et al. (2010) study (3.9%). The prevalence of exposure to bullying (32.4%) was markedly higher than the prevalence reported in the Pejtersen et al. (2010) study (8.3%). The prevalence also was higher than studies from the U.S., Australia, New Zealand, and the United Kingdom, but lower than a Canadian study. Specifically, a 2017 national study in the United States found that 9% of workers had been bullied in the last 12 months (Workplace Bullying Institute, 2017). An Australian study found that 9.7% of workers had been bullied in the last six months (Safe Work Australia, 2016), while a New Zealand study found 17.8% of workers had been bullied in the last 12 months (Bentley et al., 2009). A 2015 national poll in the United Kingdom conducted by YouGov on behalf of the Trade Unions Congress (TUC) found 29% of workers had experienced bullying (Trade Unions Congress, 2015). A 2014 nationwide poll conducted by the Harris Poll on behalf of CareerBuilder found 45% of Canadian workers felt that they had been bullied (CareerBuilder, 2014). The reference period was unclear for both the TUC and CareerBuilder studies. Comparisons between studies on prevalence is further limited by a lack of consistency in defining bullying and whether to use a criterion method, self-labelling method or both.

Overall, the results from this study provide further support for the PUMA theoretical model; the association between both individual (e.g., gender and age) and psychosocial work environmental factors (e.g., quantitative demands), and individual personal, work-related, and client-related burnout. To our knowledge, this is the first cross-national study to assess levels of burnout in RAs.

LIMITATIONS OF THE STUDY

This study has several limitations. First, the exact number of RAs for each geographic jurisdiction is unknown as there is no mandatory requirement to register with any professional body. Thus,

it is not possible to assess the representativeness of the sample. Second, selection bias is possible as the response rate was quite low. However, the rate was quite similar to those in other population surveys. For instance, Shambrook, Roberts, and Triscari (2011) achieved a response rate of 17.4%, while Kerridge and Scott (2018) achieved an overall response rate of 12.2%. Third, as the target population of this study was RAs, the findings may not be generalizable to other groups. Fourth, the reliance on self-reporting may have resulted in recall bias although the tools have been previously validated. Finally, given the cross-sectional design employed in this study, determining causation is not possible.

Implications and Future Directions

The findings from this study provide preliminary evidence that a proportion of RAs around the globe is experiencing high PB, WRB, and CRB. In addition, several demographic, job-related, and psychosocial work environment factors have been shown to be independently associated with the different types of burnout, including gender, age, qualification level, self-rated health status, job satisfaction, years employed as RAs, workload, work-life balance, exposure to sexual harassment, threats of violence, and bullying. The onus is on research organizations to provide healthy psychosocial work environments to ensure positive client, RA, and organizational outcomes. Future strategies to reduce the prevalence of burnout in RA need to be multi-level; targeting both individual and psychosocial environmental factors. Strategies may include workplace coaching and mentoring, paid study leave, workshops in stress management, fair remuneration, promoting a workplace culture that cultivates work-life balance, utilizing flexible work arrangements, monitoring workplace satisfaction with a view to continuous improvement, reducing workloads and creating policies to eliminate sexual harassment, threats of violence, and bullying behaviour.

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KT, KS, JB, and QT contributed significantly to the paper. KT, KS, and JB conceived of the study, developed the methodology, administered the project, developed the questionnaire, coordinated the data collection, and prepared the visualization for the manuscript. KT led the study conceptualization, methodology, administration and data collection. KT and QT undertook data cleansing and data analyses. KT and QT prepared the manuscript. All authors critically reviewed and approved the manuscript.

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