

Original Article

Impact of the COVID-19 pandemic on the burnout rates of graduating Canadian Urology residents

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Objective

To assess the impact of coronavirus disease 2019 (COVID-19) on burnout rates in Canadian Urology trainees.

Subjects and Methods

A total of 37 chief residents representing all 12 Canadian Urology residency programmes attended a preparatory examination in December 2019 pre-pandemic and 39 chief residents attended virtually in November 2020 during the pandemic. The Maslach Burnout Inventory (MBI) for medical professionals' questionnaire was administered anonymously to both groups. The MBI covers emotional exhaustion, depersonalisation, and personal accomplishment. Descriptive statistics were used to analyse the data.

Results

There was a 100% response rate in the convenience sample ($n = 37$) in 2019 and 64.1% response rate ($n = 25$) in 2020. Overall, 70% of chief residents in Canadian Urology programmes showed evidence of burnout in 2019 compared to 88% in 2020 ($P = 0.101$). There was a statistically significant difference between the two cohorts in emotional exhaustion (mean [SD] 16.2 [5.6] in 2019 and 20.2 [6.2] in 2020, $P = 0.011$) and personal accomplishment scores (mean [SD] 32.2 [4.5] in 2019 and 30.6 [3.6] in 2020, $P = 0.039$).

Conclusions

This study is the first to examine the impact of the pandemic on burnout rates in Urology trainees. Burnout rates are high in trainees at baseline, and the pandemic appears to have exacerbated emotional exhaustion, and personal accomplishment, but not overall burnout rates. Vigilance and proactive steps need to be implemented to alleviate this crisis.

Keywords

academic training, COVID-19, pandemic, professional burnout, residency

Introduction

Burnout is a work-related psychological syndrome characterised by emotional exhaustion, decreased sense of personal accomplishment, and depersonalisation [1]. Increasing attention is being focused on physician burnout due to its negative effects on both providers and their patients, as burnout is associated with depression, increased risk of suicide, decreased patient satisfaction, increased risk of medical errors, and higher costs to healthcare system [2-8]. Burnout among surgeons is increasing with prevalence rates of >50% [7].

One survey of 1011 Urology residents from the USA and Europe found burnout rates as high as 68.2% [8]. Choosing Urology, choosing medicine and choosing academics, along with hours worked all negatively affected burnout. Statistically

significant protective factors included reading for relaxation, time with family, as well as structured mentorship and mental health services. In addition, trainees with burnout were less likely to pursue Urology again.

Coronavirus disease 2019 (COVID-19) has affected the medical system in a multitude of ways. Clinically, there has at times been a reduction in elective surgery, a switch to a virtual mode of care delivery, and in some instances, a redeployment to COVID-19 care. Medical education has increasingly moved on-line. This along with a pervasive threat to personal, and familial safety from the virus itself has the potential to increase stress and depression levels in medical trainees. Recent research has shown that frontline healthcare workers have a high risk of developing unfavourable mental health outcomes and may need psychological support or interventions [9]. Qualitative research among Chinese

healthcare workers showed that the intensive work during the pandemic drained healthcare providers physically and emotionally [10]. In the COVID-19 pandemic, burnout in healthcare workers has been associated with fewer years of experience and decreased sleep length [11], which would put medical trainees at higher risk.

The aim of this study was to assess the impact of COVID-19 on burnout rates in graduating Urology trainees. A survey assessing burnout was administered to two cohorts of graduating Canadian Urology residents at similar points in their training. The first cohort was before the onset of the COVID-19 pandemic in December 2019, and the second was in the middle of the second wave of virus spread in November 2020. The hypothesis is that burnout rates in urology trainees will be negatively impacted by the COVID-19 pandemic.

Subjects and Methods

A total of 37 chief residents representing all 12 Canadian Urology residency programmes attended the Queen's Urology Examination Skills Test (QUEST) on 13 and 14 December 2019 and 39 chief residents attended virtually on 27 and 28 November 2020. QUEST is an annual mock examination held for graduating Canadian residents with the goal of simulating their upcoming licensing examinations. Attendance is 100% of all Canadian chief urology residents. The two groups were independent of each other, with no one represented in both cohorts.

A 47-question survey was developed to study the prevalence and predictors of burnout in graduating Canadian Urology trainees. The Maslach Burnout Inventory (MBI) for medical personnel was used in this survey to study levels of burnout. This validated instrument uses a composite score that takes into consideration the three subscales based on questions relating to emotional exhaustion, depersonalisation, and personal accomplishment [1]. The MBI accounted for 22 questions. In accordance with convention, burnout was assessed as a binary variable with those reporting 'once a week or more' on either the emotional exhaustion or depersonalisation domains considered as meeting the criteria for burnout [12]. Quality of life (QoL) was measured using linear analogue self-assessment on a 5-point Likert scale.

The remaining 25 questions were included to assess programme specific and personal characteristics and have previously been used in a burnout study as complementary to the MBI [8]. Resident characteristics included gender and relationship status. Individual characteristics included regularly employed relaxation techniques (including yoga, meditation, and reading), as well as perceived difficulty managing self-care activities (including exercise and scheduling doctor appointments). Programme characteristics included number of co-residents, work hours, night and

weekend call schedule, structured mentorship programme, and access to mental health. Other characteristics of the survey included fatigue, QoL, fellowship and career plans after training, as well as caffeinated and alcoholic drink consumption.

The Queen's University Health Sciences and Affiliated Teaching Hospitals Research Ethics Board (HSREB) approved the present study. Objectives of the study and assurance of confidentiality was distributed to the residents responding to the survey.

The survey was provided to all 37 participants in the in-person 2019 programme and had a 100% response rate ($n = 37$) and provided electronically to all 39 participants in the 2020 virtual programme and had a 64.1% response rate ($n = 25$).

Data were imported into the IBM Statistical Package for the Social Sciences (SPSS), version 26 for Windows 2019 (IBM Corp., Armonk, NY, USA) for statistical analysis. Data were initially analysed descriptively, including frequencies and percentages for categorical data, and means and SDs for continuous data. Pearson chi-square tests were used to assess the association of categorical variables with burnout, and independent samples *t*-tests were used to assess the associations for continuous data. The same analyses were used to compare the two cohorts of 2019 and 2020. A multivariable logistic regression model for burnout was developed based on the variables that had a significant association with burnout in the bivariate analyses. A $P < 0.05$ was used as the criteria for statistical significance and no adjustment was made for multiple comparisons.

Results

There was a 100% response rate in the convenience sample ($n = 37$) in 2019 and 64.1% response rate ($n = 25$) in 2020. There was no difference in gender between the responders (28% female) and the non-responders (28.2% female) in the 2020 cohort. In total, 70% of chief residents in Canadian Urology programmes showed evidence of burnout in the pre-pandemic cohort of 2019 compared to 88% of chief residents in the pandemic cohort of 2020 ($P = 0.101$). There were higher rates of emotional exhaustion and depersonalisation and lower rates of personal accomplishment following the COVID-19 pandemic compared to the similar cohort in 2019. Moderate-to-high emotional exhaustion was 68% in 2020 compared to 45.9% in 2019, corresponding to mean (SD) scores of 20.2 (6.2) and 16.2 (5.6), respectively ($P = 0.011$). Moderate-to-high depersonalisation was 80% compared to 62.2% (mean [SD] scores of 9.1 [3.7] and 7.1 [3.5], $P = 0.148$) and low-to-moderate personal accomplishment was 96% compared to 86.5% the previous year (mean [SD] scores of 32.2 [4.5] and 30.6 [3.6], $P = 0.039$; Table 1).

Urology residents exhibiting burnout reported higher rates of fatigue (100% vs 85.7%, $P = 0.05$) and had more difficulty

Table 1 Comparison of the MBI scores and subdomains between the pandemic and pre-pandemic cohorts.

Variable	Pandemic 2020 cohort (N = 25)	Pre-pandemic 2019 cohort (N = 37)	P*
Emotional exhaustion score, mean (SD)	20.2 (6.2)	16.2 (5.6)	0.011
Low (0–18), %	7 (28)	20 (54.1)	
Moderate (19–26), %	13 (52)	16 (43.2)	
High (≥27), %	4 (16)	1 (2.7)	
Depersonalisation score, mean (SD)	9.1 (3.7)	7.1 (3.5)	0.148
Low (0–5), %	5 (20)	14 (37.8)	
Moderate (6–9), %	9 (36)	13 (35.1)	
High (≥10), %	11 (44)	10 (27.0)	
Personal accomplishment score, mean (SD)	30.6 (3.6)	32.2 (4.5)	0.039
Low (0–33), %	15 (60)	9 (24.3)	
Moderate (34–39), %	9 (36)	23 (62.2)	
High (≥40), %	1 (4)	5 (13.5)	
Burnout, %			
Yes	22 (88)	26 (70.3)	0.101
No	3 (12)	11 (29.7)	

*P values are based on the independent samples t-test for the three scores and the chi-square test for burnout. Categorisation of the three scores is provided for additional insight.

scheduling doctor appointments (75% vs 25%, $P = 0.04$). There was an inverse relationship between satisfaction of the balance between personal and professional life and burnout. Urology residents exhibiting burnout had a higher rate of dissatisfaction (35.4% vs 0.0%, $P = 0.02$). There was also a direct relationship between caffeine beverage consumption and burnout. Residents with burnout reported a higher intake of caffeine beverages (93.5% vs 64.3% consuming ≥ 1 caffeinated beverage/day). Conversely, no difference was found in alcohol consumption between those with and without burnout. Additional demographic and questionnaire data are provided in Table S1.

Protective factors were also analysed to determine statistical significance. Residents without burnout reported higher rates of securing a job in Urology after residency (64.3% vs 20.8%, $P = 0.003$).

In summary, factors predictive of burnout in this study include: dissatisfaction between personal and professional life, fatigue, increased coffee consumption, difficulty scheduling doctors' appointments, and inability to secure a job after graduation. On multivariate analysis, fatigue could not be assessed because of the low incidence of residents reporting not being fatigued, and difficulty scheduling doctors' appointments dropped off as a significant factor (Table 2).

Table 2 Multivariate logistic regression of predictors of burnout.

Variable	Odds ratio (95% CI)	P
Dissatisfaction between personal and professional life	10.8 (1.5–83.3)	0.020
Coffee consumption (≥ 1 /day)	17.2 (2.0–150.2)	0.010
Difficulty scheduling doctor visits	5.8 (0.6–53.4)	0.118
Securing a job in Urology	7.6 (1.3–43.5)	0.024

Discussion

Burnout syndrome was first characterised in the early 1970s [1]. Prevalence of burnout is higher among individuals whose job involves interactions with people (e.g., physicians, nurses, social workers) [13]. From 2011 to 2014, burnout among practicing Urologists increased from 41.2% to 63.6% [14]. In the UK and Ireland, burnout in Urologists is evident with 23.5% showing emotional exhaustion and 15% resorting to drugs and alcohol to deal with burnout [15]. An AUA survey of 1126 practicing Urologists demonstrated burnout in 41.3% of Urologists aged <65 years [16]. In that cohort, younger age and increased working hours were associated with higher rates of burnout. This was similar to a study in Germany where Urologists aged <45 years had higher rates of burnout compared to their colleagues aged >45 years [17]. In a review, Fran-Guimond et al. [18] demonstrated that burnout penetrates the Urology medical culture as early as residency training and continues to be a major factor in job dissatisfaction, interpersonal conflicts, and substance abuse. In fact, trainees appear to be particularly vulnerable to burnout, and its negative consequences. A 2018 national study followed 4700 resident physicians examining levels of burnout. Of those resident physicians, 59 chose Urology and the burnout rate in that cohort was 63.8%, the highest of any specialty surveyed [19]. Hu et al. [20] surveyed 7400 General surgery residents; 91.8% reported emotional exhaustion, 70% reported depersonalisation, and 76.6% had cumulative burnout. This not only showed evidence of poor psychological wellbeing in surgical training but also showed increased odds of self-reporting near miss medical errors or medical errors resulting in harm [21].

The COVID-19 pandemic has challenged the healthcare system in unprecedented ways, leading to providers adapting dramatic change in care delivery, and upending familiar

routines. Urology trainees are no exception; they have seen elective surgical volumes reduced, and care delivery switching to a virtual format. In some locations, although not in Canada, they have had to be deployed to COVID-19 care. Programmes have scrambled to deliver teaching sessions, and journal clubs in an on-line format. However, these in-person sessions used to form the backbone of socialising, team building and peer support among the residents. These unique challenges compound the stress faced by all of society of a novel virus presenting a deadly threat to a person's health and their loved ones.

This study is the first to examine the impact of the COVID-19 pandemic on burnout rates in Urology trainees. The burnout rate among chief urology residents in Canada was already high at baseline at 70% prior to the pandemic. These results are on the high end of those found by Marchalik *et al.* [8], who reported a range of burnout of 26% in French residents to 68.2% among Portuguese residents. In American urology residents, the burnout rate was reported at 45% [22].

In the midst of the pandemic, domains of the MBI worsened with a notable increase in emotional exhaustion and decrease in personal accomplishment.

One proposed model of burnout suggests a process that occurs over time with emotional exhaustion being an early step as a response to work stressors. Typically, cynicism or depersonalisation come next with a sense of a lack of personal achievement being a late sign of burnout [23]. Indeed, in this cohort, we see that the emotional exhaustion domain scores have worsened more than the other two. It may be that as we continue with the pandemic, all domains could continue to worsen, and this merits ongoing attention.

Factors predictive of burnout in this study include: dissatisfaction between personal and professional life, fatigue, increased coffee consumption, difficulty scheduling doctors' appointments, and securing a job in urology. On multivariate analysis, fatigue could not be assessed because of the low incidence of residents reporting not being fatigued, and difficulty scheduling doctors' appointments dropped off as a significant factor. Dissatisfaction between personal and professional life stood at 27.4% for both cohorts of this study and is somewhat lower than that previously reported in American (44%) and European (56%) residents [8]. Work hours have been previously predictive of burnout [16]. At 35.5%, a higher percentage of Canadian chief residents work >80 h/week when compared to American, or European residents. Nonetheless, work hours were not predictive of burnout in this population, and it appears that dissatisfaction between personal and professional life is a qualitatively different factor that is not merely accounted for by hours worked. For instance, securing a job after graduation seems to be a paramount issue for this cohort, and is itself predictive of burnout. Dissatisfaction in the job market among

Canadian graduates has been a chronic problem; only 12.3% and 14.7% of cohorts graduating in 2010–2011 and 2015–2016, respectively, reported that they had secured a position after residency, with the overwhelming majority pursuing further training through clinical fellowships [24]. The vast majority of these fellowships are in the USA. COVID-19 travel restrictions during that phase of the pandemic may have added to the stressors that residents were experiencing related to career trajectories upon graduation.

Having a structured mentorship programme can help reduce burnout among trainees [8]. Very few residents had a structured mentorship programme (32.4% in 2019 and 23% in 2020). Given that securing a job seems to be a significant stressor in this cohort, mentorship could play a key role in terms of career counselling. Additional strategies that have proven beneficial in reducing burnout in other studies include taking steps to increase self-wellness and being proactive in one's care [21], taking personal time and seeking professional assistance to reflect on goals, stressors and life and career priorities [1], as well as maintaining personal interests and allocating time outside of work for family and social activity [25]. Unfortunately, some of these strategies are not effective in a pandemic environment where social isolation is rampant, and avenues for distraction such as gyms, restaurants, and theatres are closed. The dissatisfaction between personal and professional life seen in this group would not be helped by the pandemic where personal interests are not kindled, but the job demands remain unchanged.

The strength of this study is that it is the first looking at the impact of COVID-19 on the burnout rates in chief urology residents by comparing similar cohorts before and during the pandemic. The limitations include the limited overall number and the lower response rate (64.1%) when the survey was delivered electronically in 2020 compared to 2019 (100%). Although this constitutes a good response to an electronic survey, a potential for non-responder bias must be acknowledged. The small sample size may also have contributed to larger odds ratios and CIs in the multivariable model, and the model must therefore be considered exploratory. In addition, the COVID-19 pandemic was experienced differently depending on the prevalence of the virus in a given community. This Canadian experience may not transfer exactly to other locations. Nonetheless, there is enough of a signal here that this merits further investigation.

Conclusion

The COVID-19 pandemic has exacerbated stressors in a healthcare system in which physician burnout, a response to workplace stress, is already quite rampant. Chief Canadian Urology residents have high baseline rates of burnout. The COVID-19 pandemic appears to have increased emotional

exhaustion, and decreased personal accomplishment among these trainees, but not overall burnout. Vigilance and proactive steps need to be implemented to alleviate this crisis as we move into a new post-pandemic era.

Disclosures of Interest

None.

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Abbreviations: COVID-19, coronavirus disease 2019; MBI, Maslach Burnout Inventory; QoL, quality of life; QUEST, Queen’s Urology Examination Skills Test.

Supporting Information

Additional Supporting Information may be found in the online version of this article:

Table S1. Demographics and QoL questionnaire.