Impostorism and anxiety contribute to burnout among resident physicians

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ABSTRACT

Purpose: Physician burnout is an issue that has come to the forefront in the past decade. While many factors contribute to burnout the impact of impostorism and self-doubt has largely been ignored. We investigated the relationship of anxiety and impostorism to burnout in postgraduate medical learners.

Materials and methods: Postgraduate learners in four diverse training programs: Family Medicine (FM), Paediatric Medicine (PM), Anesthesiology (AN), and General Surgery (GS) were surveyed to identify the incidence of impostorism (IP), anxiety, and burnout. IP, anxiety, and burnout were evaluated using the Clance Impostor Phenomenon Scale (CIPS), Maslach Burnout Inventory-Human Services Survey (MBI-HSS), and the General Anxiety Disorder-7 (GAD-7) questionnaires, respectively. Burnout was defined as meeting burnout criteria on all three domains. Relationships between IP, anxiety, and burnout were explored.

Results: Two hundred and sixty-nine residents responded to the survey (response rate 18.8%). Respondents were distributed evenly between specialties (FM = 24.9%, PM = 33.1%, AN = 20.4%, GS = 21.6%). IP was identified in 62.7% of all participants. The average score on the CIPS was 66.4 (SD = 14.4), corresponding to ‘frequent feelings of impostorism.’ Female learners were at higher risk for IP (RR = 1.27, 95% CI: 1.03–1.57). Burnout, as defined by meeting burnout criteria on all three subscales, was detected in 23.3% of respondents. Significant differences were seen in burnout between specialties (p = 0.02). GS residents were more likely to experience burnout (31.7%) than PM and AN residents (26.7 and 10.0%, respectively, p = 0.02). IP was an independent risk factor for both anxiety (RR = 3.64, 95% CI:1.96–6.76) and burnout (RR = 1.82, 95% CI: 1.07–3.08).

Conclusions: Impostorism is commonly experienced by resident learners independent of specialty and contributes to learner anxiety and burnout. Supervisors and Program Directors must be aware of the prevalence of IP and the impact on burnout. Initiatives to mitigate IP may improve resident learner wellness and decrease burnout in postgraduate learners.

Introduction

A career in medicine is demanding with many aspects of training and practice contributing to the personal demands of learners and practitioners. Many of the identified stresses are increasing at a rapid pace including an aging population requiring increase care demands, rapid adoption and change of information technology systems in healthcare and relatively diminishing reimbursements and autonomy (Dean et al. 2019). As a result, predictably, the healthcare and relatively diminishing reimbursements and change of information technology systems in population requiring increase care demands, rapid adoption and practice contributing to the personal demands of learners and practitioners. Many of the identified stresses are increasing at a rapid pace including an aging population requiring increase care demands, rapid adoption and change of information technology systems in healthcare and relatively diminishing reimbursements and autonomy (Dean et al. 2019). 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In their review of physician burnout, Maslach and Leiter describe an imbalance in workload, control, reward, community relationships, fairness, and values as
The impostor phenomenon or impostorism (IP) is characterized by a chronic belief that one is less intelligent and less competent than perceived by others, as well as an inability to internalize personal success (Clance and Imes 1978; Clance and OToole 1987). IP is in all genders and many professional fields, and its prevalence in medicine has increasingly been recognized (Oriel et al. 2004; Legassie et al. 2008; Sims 2017; LaDonna et al. 2018; Gottlieb et al. 2020). The relationship between IP and its contributions to negative mental health outcomes has also been subject to inquiry (Oriel et al. 2004; Legassie et al. 2008; Leach et al. 2019; Bravata et al. 2020). In a survey of 181 residents in Family Medicine in Wisconsin, Oriel et al. (2004) found that 41% of female and 24% of male residents scored positive for IP. Furthermore, these authors found that IP was correlated with depression and anxiety in these residents. The high prevalence of IP was attributed to fears of professional inadequacy from generalists participating in learning experiences during training with specialists who possess extensive knowledge in narrowly focused areas of medical practice. In a 2008 study of Internal Medicine residents in a Canadian training program confirmed these findings with 44% of participants identified to be affected by IP (Legassie et al. 2008). However, high rates of IP are not just seen in generalist trainees, IP was also identified in residents pursuing specialist training as well (Legassie et al. 2008; Leach et al. 2019). Leach et al. (2019) found that 56% of General Surgery residents scored above the clinical IP threshold.

Compared to IP, the pervasiveness of postgraduate trainee burnout in medicine has been extensively established and characterized in a large body of scholarship (Ishak et al. 2009; Dyrbye et al. 2014; Shanafelt et al. 2015; Dean et al. 2019; Ferguson et al. 2020). Burnout is clinically defined by three distinct but interwoven components—emotional exhaustion, depersonalization, and feeling of inadequate personal accomplishment (Maslach et al. 1996; Legassie et al. 2008; Ishak et al. 2009; Leach et al. 2019). Burnout has been associated with impaired job performance and has been linked to diagnosable psychiatric disorders including anxiety (Anderson Spickard et al. 2002; Ishak et al. 2009; Roy et al. 2020).

Previous research exploring the potential contribution of IP to anxiety and burnout among postgraduate physicians has lacked statistical power due to small sample sizes. It is still not clear if the presence of IP contributes directly to burnout or anxiety (Legassie et al. 2008; Leach et al. 2019; Gottlieb et al. 2020). While there have been many recent reviews on impostor syndrome, some even linking impostorism to burnout (Gottlieb et al. 2020; Thomas and Bigatti 2020), there is also a lack of literature directly comparing the prevalence of IP in different training programs and the impacts it may have on trainee anxiety and burnout within these individual training programs. If IP is contributing to anxiety and burnout, implementation of effective strategies to mitigate IP or to target more uniquely vulnerable populations would improve overall learner wellness. In this study, we aimed to determine the prevalence of IP and explore the relationship to anxiety and burnout among Canadian postgraduate learners within Family Medicine (FM), Pediatric Medicine (PM), Anesthesiology (AN), and General Surgery (GS). These specialties represent a large proportion of postgraduate learners and span the range of generalist/specialist, technical/non-technical training programs.

Materials and methods

Study sample

A cross-sectional survey of Canadian resident physicians training in Family Medicine (FM), Pediatric Medicine (PM), Anesthesiology (AN), and General Surgery (GS) was distributed (See Supplementary Appendix for survey details). Program directors from these programs at 14 medical schools across Canada were contacted. All residents and engaged in training programs that are Royal College accredited training programs established within university-based medical school post-graduate training programs. After reviewing the study protocol, they distributed the study documents to a total of 1434 residents through email. The modified Dillman protocol was used in the distribution of the study with subsequent reminders (Armstrong 1981; Dillman et al. 2014). The data collection period was eight weeks (January to March 2020). The survey was created using Research Electronic Data Capture (REDCap) (Harris et al. 2009, 2019). The study was reviewed and approved by the Western University Health Science Research Ethics Board (REB#114162).

Measures

The survey captured demographic data including age, gender, training program, and post-graduate year (PGY), and asked the participants questions regarding the level and source of support they receive. The participants were also asked to complete three psychological inventories: the Clance Impostor Phenomenon Scale (CIPS) (Clance and Imes 1978; Clance 1985; Legassie et al. 2008), Maslach Burnout Inventory- Human Services Survey (MBI-HSS) (Maslach et al. 1996; Brusaferro et al. 2000), and General Anxiety Disorder-7 (GAD-7) Scale (Spitzer et al. 2006; GAD-7 2019; Roy et al. 2020). All three scales have been widely published and are valid and reliable; GAD-7: Cronbach’s alpha = 0.92 (Spitzer et al. 2006), Maslach: Cronbach’s alpha between 0.70 and 0.88 (Wheeler et al. 2011), and Clance: Cronbach’s alpha = 0.96 (Holmes et al. 1993).

Burnout was defined as meeting criteria for burnout on all three domains of the MBI-HSS (27 or more points on the emotional exhaustion scale, 10 or more points on the depersonalization scale, and 33 or fewer points on the personal accomplishment scale). In addition, the participants were asked about their perceived level of support. Support was defined as people, systems, or programs that provided additional coping skills or resiliency. A learner-centred approach was used to define perceived levels of support on a scale of 1–4 (no support, inadequate support, adequate support, and well-supported). Participants were also asked to free text to share their most significant source of support to further investigate what support programs, systems, or people learners most valued.
Analysis

Descriptive statistics were used to characterize residents by training specialty and training year. Continuous variables were analyzed using Kruskal–Wallis one-way analysis of variance test. Categorical variables were analyzed using Chi-square and Fisher’s Exact tests. Multivariable logistic regression was performed to determine which of the variables significant on the bivariate level remained significantly related to the outcomes on the multivariate level, after controlling for confounding variables. The stepwise model building procedure was used to determine which variables were most related to the outcome. Any additional variables that were significant on the bivariate analysis were forced into the model for each outcome. Model fit statistics were used to determine the final models. Final models were based on model fit statistics and model parsimony. Relative risks (RR) with 95% confidence intervals (CI) were generated for bivariate and multivariate analyses. Differences between groups were considered statistically significant if \( p < 0.05 \). The analysis and all statistical tests were completed using SAS Software (version 9.4; SAS Inc., Cary, NC, USA).

Results

A total of 269 residents completed all three psychological inventories (response rate = 18.8%). 89.6% of respondents were between 25 and 34 years of age and 61.0% were female. 33.5% of respondents were single while the remainder were either married (32.3%) or in a committed partnership (33.5%). Responses from the four specialties were similar: 24.9% FM, 21.6% GS, 33.1% PM, and 20.5% AN. There was a significant difference in age category across the specialties (\( p < 0.01 \)), with 71.9% of PM residents under the age of 30, followed by 61.2% of FM, and 53.4% GS residents. Only 4.0% of AN residents were under the age of 30. There were no other significant differences in demographic characteristics between the different specialties. Residents earlier in their training were the more likely to respond—31.2% of participants were in PGY1, 26.8% were in PGY2, 20.8% were in PGY3, 13.4% were in PGY4, and 7.5% were PGY5 or higher. Overall, 53.9% of residents felt ‘well-supported,’ 36.4% of residents felt they had some support and it was adequate, and 8.9% of residents felt they had some support, but it was not adequate. Only two residents did not feel supported at all. There was no difference across specialties for the perceived level of support. ‘Partner,’ ‘family,’ and ‘classmates/co-residents’ were the top-ranked sources of support.

Impostor phenomenon

IP was identified in 62.7% of participants. Female residents were significantly more at risk of IP compared to males (RR: 1.27; 95% CI: 1.03–1.57) (Table 1). Perceived level of support was significantly related to IP, such that residents who indicated inadequate level of support had a significantly higher risk of IP (RR: 1.57; 95% CI: 1.27–1.94) compared to residents who were well-supported. There was no significant increase in the risk of IP for residents who indicated adequate support (RR: 1.20; 95% CI: 0.98–1.47), compared to those well-supported. IP was not significantly related to age, relationship status, specialty, level of study, or whether a participant attended a Canadian medical school before postgraduate training.

Burnout

The number of participants that met the criteria set for burnout [high emotional exhaustion (\( \geq 27 \)), high depersonalization (\( \geq 10 \)), and low personal accomplishment (\( \leq 33 \))] was 23.3% (\( n = 60 \)). Of those participants that met the criteria for burnout the average scores on the individual subscales were: emotion exhaustion scale mean: 37.1 (SD = 7.4), median: 35.0 (IQR: 30.5–40.0), personal accomplishments scale mean: 26.7 (SD = 6.3), median: 28.0 (IQR: 25.0–31.0), depersonalization scale mean: 16.2 (SD = 4.4), median: 15.0 (IQR: 13.0–18.0).

Similar to IP, the risk of burnout increased as the level of perceived support declined. Residents who indicated that they had ‘some support’ and found it adequate were almost twice as likely (RR: 1.87; 95% CI: 1.30–3.11) to be at risk of burnout compared to well-supported residents. Residents who had ‘some support’ but found it inadequate were more than three times (RR: 3.26; 95% CI: 1.86–5.72) as likely to be at risk of burnout compared to those who felt well-supported. GS residents had the highest risk of burnout, with 31.7% of participants meeting the criteria for burnout. In comparison to GS residents both PM residents (RR: 0.55; 95% CI: 0.31–0.97) and AN residents (RR: 0.34; 95% CI: 0.15–0.79) had a reduced risk of experiencing burnout. Burnout was not significantly related to age, relationship status, level of study, or whether a participant went to a Canadian medical school before postgraduate training.

Anxiety

Moderate to severe symptoms of anxiety were present in 27.9% of residents included in this study. Compared to residents who felt well-supported, those who felt their support was inadequate was twice as likely (RR 2.19; 95% CI: 1.32–3.63) to experience moderate to severe symptoms of anxiety. There was no significant change in risk between residents who had adequate levels of support. Anxiety symptoms were not significantly related to age, relationship status, level of study, gender, or whether a participant went to a Canadian medical school before postgraduate training.

Relationship between IP, burnout, and anxiety

Further analyses demonstrated that residents who scored positive for IP were significantly more at risk for burnout (RR: 1.82; 95% CI: 1.07–3.08) compared to residents who did not demonstrate IP. Residents with IP were also more than three times as likely (RR: 3.64; 95% CI: 1.96–6.76) to experience moderate to severe symptoms of anxiety compared to residents who did not display IP. Finally, residents experiencing burnout were 2.65 times (RR: 2.65; 95% CI: 1.84–3.83) more likely to experience moderate to severe symptoms of anxiety compared to those not experiencing burnout (Table 2).
A higher score on the CIPS (representing increasing severity of IP) was significantly associated with higher scores of burnout in each of the three subscales of the MBI-HSS (emotional exhaustion, personal accomplishment, and depersonalization, \( p < 0.01 \)) (Table 3). A similar relationship was found for IP and anxiety scores. The level of anxiety was significantly higher with higher rates of self-reported IP severity (\( p < 0.01 \)).

**Discussion**

This study sought to examine the prevalence of and the relationship between IP, anxiety, and burnout in Canadian postgraduate trainees. We found that IP has a high prevalence rate in postgraduate trainees irrespective of specialty and that learners who experience IP have a significantly increased risk of anxiety and burnout. To our knowledge, this is the first report demonstrating a link between IP, anxiety, and burnout in postgraduate trainees.

Overall, 61% (\( N = 165 \)) of residents displayed IP, and there was no statistical difference among the specialties surveyed. Others have also suggested that choice of specialty or level of career is not an indicator or risk of impostor syndrome (Ladonna et al. 2018), but that impostor syndrome is pervasive in medical training both at the undergraduate (Villwock et al. 2016) and postgraduate (Gottlieb et al. 2020) training levels. This pervasiveness of IP in medicine speaks to a more systemic issue rather than individual training programs or specialties. The rate of IP is higher than previously reported (Oriel et al. 2004; Legassie et al. 2008; Leach et al. 2019). Studies conducted in Family Medicine and Internal Medicine report just over 40% prevalence of IP (Oriel et al. 2004; Legassie et al. 2008). Our results may have been influenced by the timing of the survey. Legassie et al.’s study was conducted between August to October (Legassie et al. 2008), at the beginning of an academic year whereas our study took place in January and February. Early on in training, the expectations on learners may be less and the support for transitioning to their new role may be greater. As the academic year progresses increasing responsibility, workload, and expectation of independence also increases which may predispose individuals to greater pressure and IP and burnout. Another possible explanation for our increased rate of IP would be the era in which the data was obtained. Previous research occurred in 2004 and 2008, it may be that as knowledge and expectations of trainees have increased over the past decade (Densen 2011) IP has also increased. While the overall rate of IP increased, we found that female trainees were more susceptible to IP, consistent with previously published literature, further supporting the notion that there is an increase in IP amongst postgraduate trainees (Oriel et al. 2004; Legassie et al. 2008; Villwock et al. 2016). Similarly, Mocanu et al. found that the intersectionality of female gender and visible minority status of GS residents was associated with adverse implications on their training experience (Mocanu et al. 2020). While our study found increased susceptibility of female trainees (particularly GS trainees) to IP we did not specifically focus on visual minority status as an indicator of IP. The effects of minority status on IP and burnout would be an important factor to examine in future studies.
Burnout was detected in 22.3% (N = 60) of residents surveyed, and GS residents were more likely to demonstrate burnout than PM and AN residents. Other authors have reported differences in the prevalence of burnout based on specialty but the specific contribution and risk of specialty choice remain variable (Shanafelt et al. 2015; Rodrigues et al. 2018; Ferguson et al. 2020). Our survey was distributed to residents from across Canada and is likely more representative of the Canadian residency population as a whole, compared to previous research which focused on residents in a single Canadian province (Ferguson et al. 2020). The high rate of burnout amongst postgraduate trainees (one in five) is a warning signal to those involved in postgraduate training and demands intervention.

While many contributions to burnout have been identified, IP has not previously been listed as a significant contributor (West et al. 2018). We found that increasing IP scores were closely linked with worsening scores in each of the three subcategories of burnout. Specifically, residents with IP demonstrate higher emotional exhaustion, lower personal accomplishment, and higher depersonalization. IP diminishes the residents’ ability to develop a sense of accomplishment or accept credit for positive patient outcomes. IP in this manner leads to an inability of postgraduate trainees to see themselves as an agent of positive change in a demanding healthcare system, potentially leading to an increased sense of futility and burnout. Similarly, we found a direct association between IP scores and the severity of anxiety. Given that this study was not longitudinal in nature, we cannot comment on the causal relationship of IP to anxiety or burnout. However, we believe that our findings support the notion that IP anxiety and burnout are linked.

Another novel finding of the study is the impact of learner perceived support on impostorism, anxiety, and burnout. We asked residents how they perceived their current level of support, and only half of the survey respondents felt ‘well-supported.’ Residents who had less support were significantly at higher risk of IP and burnout. Participants were asked to rank their most prominent source of support, and unequally across all specialties, partner, family, and classmates/co-residents were the top-ranked supports, emphasizing the importance of healthy interpersonal relationships that may contribute to resiliency. Formal programs of support instituted by training programs were seen as a significant source of support by only 7% (N = 21) of participants. These resources are either underutilized, unavailable, or ineffectual, representing an opportunity for training programs to improve and mitigate burnout. We found with qualitatively reviewing survey comments, that an overwhelming number of participants indicated that speaking to mentors who share similar experiences and feelings of self-doubt was beneficial in their subjective ability to overcome self-doubt. These special kinds of mentorship relationships may help to combat IP and thereby burnout in postgraduate trainees.

Demerou et al. proposed the Job Demands-Resources (JD-R) in 2001 which attempts to conceptualize burnout as an imbalance of efforts required to perform a job and the psychological, physical, and organizational resources available from which efforts can be drawn (Demerouti et al. 2001). This model has been studied in residents (Bakker et al. 2011; Zis et al. 2014) and Zis et al. (2014) found that increased personal and organizational resources were associated with a decrease in burnout. We propose that self-confidence and belief in one’s own abilities are major resources required to achieve success in residency. Others have also found that self-efficacy is protective against burnout (Janko and Smeds 2019; Milam et al. 2019) Those with IP struggle to validate their own strengths and thus cannot rely on their own competence as a resource to combat burnout.

Educators need to understand the impact of IP and develop training programs and implement resources to assist trainees in dealing with IP. Firstly, post-graduate training programs need to reframe the discussion around IP within both teachers and learners. Feelings of impostorism need to be reframed as a normal part of the post-graduate learning process and a normal situational response to engaging in post-graduate medical training (Morgenstern and Beck Dallaghan 2021). Furthermore, a culture change is necessary where seeking help must no longer be seen as weakness (Atherley and Meeuwissen 2020). Formalized teaching on IP, creation of awareness amongst faculty, and strategies to assist learners...
experiencing IP need to occur within post-graduate training programs.

Secondly, given the finding that learners perceive personal interactions rather than programmatic solutions as more supportive, programs need to strive to create supportive relationships for those experiencing IP. Training programs should invest in mentorship and coaching which allows trainees to cope with feelings of IP (Gazelle et al. 2015; Jaqua et al. 2021). Mentors need to be open and transparent about their own self-doubts, vulnerabilities, and share personal strategies to combat IP (Brown 2018).

By taking a proactive approach to mitigate IP by normalizing IP and providing supportive mentors/coaches programs may allow learners to cope with feelings of IP and potentially lessen burnout and prevent longstanding wellness and mental health issues like anxiety. While authors have called for these systemic changes (Atherley and Meeuwissen 2020), to our knowledge, there is a paucity of literature on practical actualization of these concepts which implements strategies to curtail IP a fertile ground for future inquiry.

**Limitations**

While we can demonstrate an association between IP, anxiety, and burnout, we cannot use our data set to determine causality given the cross-sectional nature of our study. Another limitation of this study, like all survey-based research, is the response rate and response bias. It is conceivable that residents more at risk for one of the three phenomena surveyed would be more likely to engage in the study. However, we argue our findings are not out of keeping with what has been found previously. Our results are highly significant and show a strong association between IP and burnout and should serve to call attention to educators and researchers alike to the future potential of this topic.

**Conclusion**

While residents in individual training programs face a unique and contextual set of challenges, we implore medical educators to recognize the universality of IP. Furthermore, IP is a potential contributor to anxiety and burnout. The direct association of IP, burnout, and anxiety demonstrates the need to mitigate IP as a strategy to diminish burnout. We call to attention culture change in postgraduate training that must take place. Specifically, transparency of uncertainty from mentors should be promoted. The pursuit of assistance must be normalized and seen as a sign of self-awareness and dedication for success rather than a sign of incompetence. Focus on diffusing the severity of impostorism among trainees will conceivably aid in the alleviation of other threats to resident well-being during training and may have lasting effects on lifelong physician wellness.

**Ethical approval**

The study was reviewed and approved by the Western University Health Science Research Ethics Board (REB#114162) on July 30, 2019.

**Disclosure statement**

The authors have no declarations of interest to report.

**Funding**

The author(s) reported there is no funding associated with the work featured in this article.

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