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The Relationship Between Psychological Distress and Perception of Emotional Support in Medical Students and Residents and Implications for Educational Institutions

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Abstract

Objective Psychological distress is pervasive among medical students and residents (MSR) and is associated with academic under-performance, decreased empathy, burnout, and suicidal ideation. To date, there has been little examination of how demographic and socioeconomic factors influence trainee's psychological distress levels, despite suggestion that financial concerns are a common source of stress. Recent Canadian studies examining the prevalence of distress, burnout, and resilience in MSR are limited.

Methods Undergraduate and postgraduate medical trainees attending a Canadian university were surveyed. The questionnaire included standardized instruments to evaluate psychological distress, burnout, and resilience. Additional items explored MSR living and domestic circumstances, and anticipated debt upon training completion. Ordinary least squares regression models determined predictors of psychological distress, risk for burnout, and resiliency. Logistic regression of psychological distress predicted risk of MSR contemplating dropping out of their training program.

Results Feeling emotionally/psychologically unsupported while attending university was a key predictor of psychological distress and burnout, while feeling supported reduces this risk. Risk for burnout increased with each year of medical training. Psychologically distressed MSR were at significantly greater odds of contemplating dropping out of their medical training program.

Conclusions Our results point to the important opportunity universities and medical schools have promoting MSR well-being by reducing institutional stressors, as well as teaching and promoting self-care and burnout avoidance techniques, instituting wellness interventions, and developing programs to identify and support at risk and distressed students.

Keywords Psychological distress · Burnout · Resilience · Medical students

Medical students and residents (MSR) experience significant psychological distress related to their work environment, medical training, and academic pressures [1]. Specific stressors may include exposure to patients with complex health issues, patients with acute and chronic medical issues, and grief from patient mortality [2]. MSR also face stressors with high tuition, achieving high grades, and obtaining further postgraduate training and job opportunities [1, 3]. Despite these stressors, MSR seldom seek services to promote wellness and to achieve work-life balance [4]. Previous studies have documented that MSR experience psychological distress, including elevated depression and anxiety [1, 5]. MSR can also experience elevated burnout [6–10], characterized by emotional exhaustion (EE) and depersonalization (DP).

Academic under-performance [11], substance misuse [12], sleep difficulties [13], decreased empathy [14], and suicidal ideation [3] are correlated with mental distress and burnout during medical school [15, 16]. This is concerning because MSR experiencing psychological distress and/or burnout rarely seek help from classmates or program staff due to fears

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regarding privacy breaches, stigma, and their career trajectories being negatively impacted [4]. Stigma-related barriers to help-seeking among MSR are hypothesized to contribute to distress and/or burnout during future practice as physicians [17]. The consequence of anxiety, depression, and burnout in MSR is significant. Previous research has demonstrated the adverse effects of stress on physicians' decision-making processes related to patient care [18]. Despite these risks, research suggests that MSR also demonstrate positive adaptation in the face of stress, or resilience [17]. To design effective supports and services for the prevention and treatment of mental stress and burnout in medical trainees, it is important to explore the factors contributing to risk and resilience.

To date, the majority of literature examining MSR distress focuses on stressors associated with their training experience [11], personal life events [6], or personality characteristics [15, 16]. Despite indications that finances are a common stressor [1], there has been little examination of how socioeconomic factors, such as educational debt, may influence MSR distress levels, burnout, or conversely, MSR resilience. The current study builds on previous survey-based research conducted by these authors [1] and others that reveal an association between MSR debt, stress levels [19], and burnout [20]. Given the paucity of research examining MSR within a Canadian context, our primary objective is to investigate possible associations between psychological distress, burnout, housing circumstances, anticipated debt, and demographic characteristics, as well as to understand the role of resilience in this process.

Methods

Sample Procedures and Description

An ethics-approved cross-sectional analysis was completed on anonymous survey materials from MSR attending a Canadian university. We recruited our sample from undergraduate (UG) and graduate (PG) medical programs in the Faculty of Medicine at Dalhousie University in Halifax, Canada. The e-survey was distributed between January and February 2013 via the Dalhousie Medical Student Society and the Resident's Professional Association. The final sample included 381 MSR, consisting of 232 UG and 149 PG, which represented a 37% response rate. Participants included 230 female students aged 22–43 ($M = 28$; SD = 3.6) and 151 male students aged 22–44 ($M = 28$; SD = 4.3).

Outcome Measures

Psychological distress was measured using the *Kessler-10* (K10), a 10-item, self-administered questionnaire that produces a global psychological distress score based on anxiety and depressive symptoms experienced in the last 30 days.

Each item is on a five-point Likert scale that, combined, yield a total score out of 50, where higher scores indicate greater psychological distress [21]. The K10 has demonstrated strong psychometric properties including good test-retest validity ($\alpha = 0.94$) [22] and good predictive validity, distinguishing clinical cases from non-clinical cases [21, 23], and is free of substantial bias regarding sex and education level [24]. Research with the K10 [1, 22] supports the use of a clinical cut-off score of 20. In the current study, K10 psychological distress levels were defined as normal [0–19], mild-moderate [20–24], moderate [25–29], and high-very high [≥ 30].

The Maslach Burnout Inventory (MBI) is considered the standard assessment for measuring burnout [25]. However, at 22 items, its length can be prohibitive, which has led to the development of the MBI-2, a two-item adaptation that demonstrates good reliability and validity relative to the full MBI [26]. The MBI-2 is comprised of two items, Emotional Exhaustion (EE) and Depersonalization (DP), presented in a 4-point Likert scale format. Total scores are commonly categorized into low, average, or high levels [25], with high levels of EE and DP defined as occurring at least weekly [26]. Consistent with the literature, the current study defined risk for burnout as likely when both high levels of EE and/or DP occur daily or weekly [14, 27].

Resilience was measured using the CD-RISC2, an abbreviated form of the Connor-Davidson Resilience Scale (CD-RISC), a well-validated measure of resilience [28]. Like its originator, the two-item scale has demonstrated good test-retest reliability, convergent validity, and divergent validity [29]. When combined, the two items generate a total score out of 8, where 7–8 is indicative of high personal resilience. In our study, scores are dichotomized into high and low outcomes [30].

Predictor Variables

MSR provided their gender, domestic or international status, program of study (i.e., UG or PG), year of study, and their current living circumstances, including residence with a domestic partner and/or dependent children. MSR were also asked to indicate which, if any, supports for mental health they were aware of while enrolled in their training program, including student services counseling, on-campus psychological services, psychologists in private practice, mental health therapists, and/or a family physician. As a dichotomized variable, MSR who were aware of 0–5 services were coded as 0, representing little awareness, while students who were aware of 6–11 services were coded as 1, representing high awareness. MSR also reported their anticipated debt upon completion of medical training (i.e., "none," "$1–49,000," "$50,000–99,999," "$100,000–149,999," "more than $150,000"), if they used alcohol within the past 4 weeks, how concerned they were about their mental health state (i.e. "not at all," "a little," "somewhat," "a lot," "a great deal"), how supported

they felt mentally and/or emotionally while at university (i.e. "not at all," "a little," "somewhat," "a lot," "a great deal"), if they had ever sought treatment for mental or emotional problems while at university, and how seriously they had considered dropping out over the last 12 months.

Results

With regard to undergraduate students, 33.2% scored above the cut-off for normal psychological distress (M = 19.6; SD = 6.3); 23.3% were at risk for burnout, deconstructed into EE (M = 22.3; SD = 14.7) and DP ((M = 8.5; SD = 9.1); and 49.1% demonstrated high resilience (M = 6.5; SD = 1.4). Among graduate students, 44.5% scored above the cut-off for normal psychological distress (M = 19.4; SD = 6.3); 38.9% were at risk for burnout, deconstructed as EE (M = 26.2; SD = 15.7) and DP (M = 12.2; SD = 9.1 for DP); and 45.6% demonstrated high resilience (M = 6.5; SD = 1.3).

Ordinary least squares regression estimates of the effects of demographic variables, socioeconomic status, substance use, self-rated mental health, and propensity for help-seeking on psychological distress, burnout, and resilience were conducted. Age and current debt were excluded due to concerns with multicollinearity. Statistical power was set at .80 and our sample size allowed for the detection of a medium size effect (p = .05) [31].

Table 1 presents the regression model for psychological distress, burnout, and resilience. Concern over mental health state had a significant positive effect on psychological distress (β = 0.58). MSR who were concerned about their mental health state reported greater psychological distress. For every increase of one standard unit of concern over mental health state, there was a corresponding increase of 0.58 units of psychological distress. Level of self-perceived support during medical training had a significant negative effect on psychological distress (β = −0.18). Students who felt more supported reported lower psychological distress. For every increase in one standard unit of self-perceived support, there was a corresponding decrease of 0.18 unit of psychological distress.

In the regression model for DP, PGs had higher levels of DP (β = 0.18), compared to UGs. Upper year trainees experienced more DP than their junior colleagues. Enrollment in the upper year of training (i.e., PG) corresponded to a 0.18 unit increase of depersonalization relative to the UG. Year of study also had a significant positive effect on emotional exhaustion (β = 0.70). Enrollment in the upper year of training corresponded to a 0.70 unit increase of emotional exhaustion, relative to the UG. Simply stated, MSR in higher years of training were more likely to report feeling depersonalized. Concern over mental health state had a significant positive effect on DP (β = 0.34). For every increase of one standard unit of concern over mental health state, there was a corresponding increase of 0.34 units

of depersonalization psychological distress, or more simply, students who were concerned about their mental health state report more DP. Finally, level of self-perceived mental and/or emotional support had a significant negative effect on DP (β = −0.18). For every increase of one standard unit of self-perceived support, there was a corresponding decrease of 0.18 units of depersonalization.

In the regression model for the EE, MSR in higher years of study reported more EE than those in earlier years of study (β = 0.12). For every increase of one standard unit of years of training, there is a corresponding increase of 0.12 units increase of emotional exhaustion. Simply stated, MSR in advanced years of training were more likely to feel emotionally exhausted. Students who were concerned about their mental health state reported greater EE (β = 0.41). Finally, students who felt supported while at university reported less EE (β = 0.14).

In the regression model for resilience, MSR who reported drinking alcohol within the past 4 weeks reported significantly higher levels of resilience (β = 0.11). MSR who were concerned about their mental health state reported less resilience (β = −0.29). Finally, for every increase of one standard unit of self-perceived support, there was a corresponding increase of 0.14 units of resilience, or more simply, trainees who felt supported during their medical training reported greater resilience (β = 0.14).

Lastly, a binary logistic regression of psychological distress predicting dropout contemplation was performed (see Table 2). MSR who reported elevated levels of psychological distress were 6.04 times more likely to have contemplated dropping out of their training programs within the past 12 months.

Discussion

Although psychological distress and burnout are prevalent among MSR [1, 32], no recent studies have examined these difficulties in a Canadian context. Our study reveals that a significant number (41.5%) of MSR reported experiencing above-normal psychological distress (K10 ≥ 20), with a sizeable number (9.2%) reporting high to very high psychological distress. These findings are comparable to other studies [3, 16] that show elevated psychological distress to be common among MSR throughout their training.

Individual factors, including sociodemographic factors (educational status and anticipated debt), were not associated with MSR psychological distress. Rather, psychological distress, as well as burnout, are most strongly predicted by MSR's perceptions of how emotionally and/or mentally supported they feel while attending university. We interpret this to mean that MSR who reported experiencing elevated levels of psychological distress and/or burnout feel under-supported

Table 1　Regression of psychological distress, burnout, and resilience

	K-10[a] Psychological distress β (B)	MBI[b] Depersonalization β (B)	MBI[b] Emotional exhaustion β (B)	CD-RISC2[c] Resilience b (β)
Sociodemographic variables				
Gender (male = 1)	0.07 (−0.75)	0.05 (0.86)	−0.06 (−1.83)	0.03 (0.08)
Domestic or international student 　　(domestic student = 1)	−0.03 (−1.28)	0.03 (1.95)	0.07 (6.47)	0.09 (0.72)
Educational status				
Program of study	0.02 (0.22)	0.18 (3.38)*	0.12 (3.76)*	0.02 (0.05)
Year of study	0.04 (0.18)	0.17 (1.30)*	0.10 (1.28)*	0.05 (0.06)
Family status				
Living with a partner (yes = 1)	−0.08 (−0.95)	−0.05 (−0.95)	−0.03 (−0.85)	0.09 (0.24)
Has dependent children (yes = 1)	0.01 (0.14)	−0.01 (−0.29)	0.02 (0.73)	−0.03 (−0.10)
Financial characteristics				
Anticipated debt	0.04 (0.16)	0.00 (0.02)	0.00 (0.02)	0.03 (0.03)
Substance use				
Alcohol use (yes = 1)	0.06 (0.91)	0.10 (2.28)*	0.03 (1.13)	0.11 (0.38)*
Drugs use (yes = 1)	−0.03 (−0.67)	−0.08 (−3.26)	0.05 (−2.91)	−0.01 (−0.04)
Self-reported mental health				
Concern over mental health state	0.58 (3.48)*	0.34 (3.08)*	0.41 (6.01)*	−0.29 (−0.37)*
Self-perceived support				
Feels supported at university	−0.18 (−1.139)*	−0.18 (−1.70)*	0.14 (−2.17)*	0.14 (0.19)*
Propensity of help-seeking				
Receiving treatment for mental or 　　emotional problems (yes = 1)	0.04 (0.51)	−0.01 (−0.30)	−0.06 (−1.86)	−0.06 (−0.17)
Awareness of services 　　(high awareness = 1)	0.01 (0.12)	0.01 (0.22)	0.02 (0.64)	−0.03 (−0.11)
R^2	0.48	0.28	0.27	0.19

Standardized beta weights = β; unstandardized coefficients are in parentheses

*$p < 0.05$

[a] Kessler-10

[b] Maslach Burnout Inventory-2

[c] Connor-Davidson Resilience scale (abbreviated form)

emotionally and psychologically while attending university, suggesting an opportunity for universities and training programs to enhance the resources available to trainees.

Regardless of year of study, MSR report consistent levels of distress. This suggests that psychological distress may be a constant for a subgroup of MSR throughout their training experience. However, without a baseline for MSR psychological distress prior to program admission and without a longitudinal design, we are unable to determine if certain MSR enter their respective programs already distressed, nor can we illuminate individual trajectories of MSR distress as they move through their respective programs.

In contrast, our results pertaining to burnout reveal a slightly different picture of MSR coping. Compared to what may be a constant level of distress throughout MSR training, burnout may increase in each year of programming. MSR in upper years of training are at greater risk for burnout relative to those in more junior years of training. Burnout rates within our sample are alarmingly high, suggesting the possibility that emotional and psychological supports may be sub-optimal for MSR during their training and/or that training expectations may exceed the coping resources of some trainees. This finding is consistent with Dunn, Iglewicz, and Moutier's [17, p. 44] model of MSR coping, referred to as the coping reservoir. They postulate that the trainee's "…reservoir can be replenished or drained" as a factor of their experiences,

Table 2　Binary logistic regression of psychological distress predicting dropout contemplation

	β (SE)	OR
K-10	1.80 (0.34)*	6.04

*$p < 0.05$

personal traits, and coping styles. Consistent with this model, our findings show that a subgroup of MSR in each year of the program is comparably distressed; however, their risk for burnout increases with each subsequent year of training. For these MSR, their emotional/psychological reservoirs may be draining with each successive year, underlining the need for protective factors to be built into the training experience to overcome and/or minimize the impact of training stressors related to fatigue, lack of resources/support, and work overload. These findings also point to the potential benefits of universities targeting senior MSR at greatest risk for burnout with programs designed to prevent or reduce institutional/training stressors while augmenting individual MSR coping.

Our findings show that a concerning number of MSR experienced elevated levels of psychological distress (41.7%) and burnout (29.4%). However, approximately half (52.2%) of the MSR population reported being highly resilient. Our regression analysis revealed that feeling supported while at university was a significant predictor of MSR resilience. These findings are congruent with other studies [33] that show the interrelationship between MSR experiences of burnout and resilience.

Taken together, our findings highlight that although most MSR are resilient, a sizable group of MSR are at risk for elevated distress and/or burnout. A smaller, potentially more vulnerable group of MSR report feeling unsupported during their training, experiencing psychological distress and burnout levels of such significance that they actively contemplated dropping out of their programs (14.7%), considered suicide (7.3%), and/or are accessed mental health supports (33.3%). These findings highlight the important opportunity that universities have to contribute to MSR well-being and mental health. Universities may be key institutions to promote health because of the symbiotic relationship that exists between health and education [34]. Campus mental health strategies encourage universities to employ leadership in the promotion of mental health through awareness, early identification, prevention, and direct services and supports [34]. Our findings suggest the importance and necessity for universities to develop and implement mental health strategies that consider the emotional and psychological needs of trainees and commit supports to minimize structural/institutional risk factors while maximizing trainee coping [34].

Our research also appears to provide a preliminary picture of factors that may ameliorate the impact of distress and burnout, although future research employing structural equation modeling could further elucidate the interconnections between these variables. Our findings suggest that MSR who are able to manage the heavy demands of their programs without depleting their emotional resources, while also maintaining a positive outlook toward their relationships with colleagues and patients, may be less likely to experience burnout. Psychological flexibility, or the ability to maintain "mindful awareness of one's thoughts and feelings," [35, p. 2] has been positively correlated with perceived quality of life and affective well-being. Our findings also suggest that MSR who are able to manage their emotions and thoughts in this manner may be more resilient to psychological distress and/or burnout.

Resilience has become an increasingly important concept to the mental health professions, as increased resilience may be related to neuropsychiatric disease prevention after exposure to environmental stressors [36]. Research on resilience suggests that most MSR demonstrate high resilience relative to general population estimates and that greater resilience predicts greater access to resources, including mental health supports, which in turn contributes to greater resilience [30]. Research underlines the value of efforts to buttress and/or enhance resilience in MSR rather than assuming that resilience is universal, uninterrupted, and/or self-replenishing within trainee populations. Our research suggests that MSR resilience may be buttressed and/or enhanced by targeting MSR's perceptions of their mental state and their perceived or actual experiences with feeling mentally and/or emotionally supported. In fact, our findings reveal that these two factors had the most significant statistical impact on the reported levels of MSR psychological distress, burnout, and resilience. This finding may be particularly important during this time of investment in student mental health, as it suggests a move away from problematizing MSR with regard to burnout and distress and/or focusing exclusively on enhancing individual coping within existing institutional structures. Rather, our findings invite universities to consider how they might play an important role in addressing structural/institutional risk factors while implementing protective factors in order to decrease the incidence of psychological distress and burnout while enhancing resilience.

Our results also point to the importance of ensuring that universities focus attention on the affective well-being of their students and support students to manage their thoughts and feelings in response to the stressors from program commencement through program completion. Preventing burnout and/or distress requires early identification and remediation. According to our results, MSR may be at risk to experience distress from day one of their programs, and therefore, universities should consider developing early identification methods for vulnerable students. Frequently, academic advisors and peers have the greatest insight into student coping, perhaps making them the best MSR supports. For professors and peers to be effective in this role, however, they may benefit from tools to help identify student distress, including the ability to differentiate normal stress from clinical levels of distress [17], and to then provide appropriate and timely support, including remediation and facilitation of access to available mental health, academic, or career counseling.

However, we need to recognize that due to stigma, MSR help-seeking is limited, sometimes due to the culture of academic medicine [17]. Therefore, university staff and educators need to be well versed in providing a safe, non-threatening, and supportive context to explore issues such as psychological distress and burnout, as well as their precursors, such as the feeling of being unsupported. In addition, peer-mentors may play an important supportive role in preventing and/or ameliorating MSR distress and burnout while helping to enhance resilience. For example, our findings linking MSR alcohol use and resilience may suggest an element of peer support. At face value, we can interpret the use of alcohol as a possible self-medicating strategy to cope with daily stressors. However, as few MSR (6.6%) report engaging in concerning levels of alcohol use, this finding may also suggest that MSR engaging with peers, as is common when students imbibe alcohol, may be a further factor contributing to resilience. Further research on the interaction of peer socializing, substance use, and MSR coping is needed.

Despite the level of distress identified in this and other studies, many MSR exhibit resiliency in the face of training and/or work demands. Our research confirms the relationship between resilience and reduced psychological distress. A growing body of literature is examining the relationship between predictors of resilience and life satisfaction, which is inversely related to distress [37, 38]. Factors such as positive emotions [37] and work-life balance [38] have been shown to build resilience. In line with our results, Kjeldstadli et al. [38] found that resilient students are able to maintain a personal perception of wellness and balance. It appears that resilient students are able to shift focus away from a negative mental state and are able to benefit from the social support of others. An important suggestion arising from these findings is that MSR should be encouraged to maintain outside interests, leisure activities, and friendships/peer supports, as work-life balance contributes to a positive perception of stress and coping capabilities. Furthermore, ensuring that university health and wellness services are readily accessible to MSR and delivered effectively without fear of stigma could potentially alleviate MSR psychological distress and burnout, as well as augment their resiliency.

Our study has several important strengths. To our knowledge, this study represents the most recent to report on MSR psychological distress, burnout, resilience, and anticipated debt within a Canadian context. Anonymous responses limited biases related to social desirability. The use of established psychometric instruments allows for comparisons with the general population and other samples of medical students and residents. Our study has several limitations, however. First, because data has been collected via self-report on screening tools, it is possible that some variables are misclassified. For example, it is possible that self-reports via the K10 may under- or over-represent symptoms of depression and/or anxiety. However, this risk is mitigated by the sound psychometric properties of this tool. Furthermore, a first-year medical student may be more likely to incorrectly estimate future debt relative to a medical resident in their last year of training. Second, due to our methodology, it is not possible to determine causation; therefore, the observed relationships are best interpreted as associations. Third, our response rate was lower than typical medical student surveys, which could mean that our sample is not representative of the MSR experience at this institution, causing concerns for generalizability of the findings. For example, it is conceivable that our sample could over-represent those MSR who experienced greater levels of distress and/or less perceived emotional support and who may be more likely to complete our survey on this stigmatized topic area as a means of anonymously expressing their concerns. However, we are comforted to some degree by the fact that our response rate is comparable with other web-based studies [39] and that our sample's distribution was not skewed for the key variables examined. Fourth, despite the anonymity of responses, the competitive nature of medical programs tends to encourage MSR to present themselves in the most positive light [35]. However, given the level and pervasiveness of distress and burnout reported, social desirability is unlikely a major concern. Finally, because minimal demographic information was gathered on MSR (i.e., cultural background/ethnicity), and because these variables may be influential in the experience of distress [40], we were unable to ascertain whether unique demographic factors influenced our results.

In conclusion, "the goal of medical education is to train knowledgeable, competent, and professional physicians equipped to care for the nation's sick, advance the science of medicine, and promote public health" [32, p. 354]. Overall, medical schools are in the position to address structural stress factors, as well as promote MSR well-being, by teaching and promoting self-care, instituting wellness interventions, educating MSR on burnout risks, and developing programs to support at risk and distressed MSR. Additional research is needed to explore causal relationships and to determine optimal approaches to promote student well-being. If university-led initiatives and MSR themselves can facilitate resiliency, both the trainees and their future patients will benefit. Our findings suggest that universities can play an important role in MSR feeling supported and may be essential in offering programming emphasizing the importance of positive student social support networks. Furthermore, as risk for burnout increases with each additional year of medical training, early intervention may help avoid the potential sequelae of burnout including depression, substance misuse, relationship breakup, and risk of sub-optimal patient care and/or medical errors.

Compliance with Ethical Standards This study was approved by IWK Research Ethics Board (IWK-REB Project No. 1011440).

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