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Ontario Medical Students Association
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POSITION PAPER

Reducing suicide risk in medical students and residents

Irina Petrovic[1*], Maya Hartman[1*], Kathy Zhang[2]

[1] Michael G. DeGroote School of Medicine, McMaster University
[2] Schulich School of Medicine, Western University

* These authors contributed equally to this work.

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SUMMARY OF KEY POINTS

- **Rate of suicide is disproportionately elevated in physicians compared to the general population, with risks of suicide impacting all stages of medical education.**
- **There is a deficit of institutional data about suicide-related supports, specifically for medical learners and gaps for improvement to be incorporated based on current peer reviewed literature from Canada and the United States**
- **Our recommendations focus on 1) anonymous screening strategies, 2) a comprehensive approach to targeted interventions, and 3) a coordinated, compassionate response for peers after a suicide in the medical community.**

INTRODUCTION

Suicide rates are elevated in physicians compared to the general population. One meta-analysis reported a standardized mortality ratio for suicide of 1.44 in physicians worldwide.[1] The risk has been found to be markedly higher in female physicians and moderately higher in male physicians compared to the general population.[2] This increased risk of suicide may begin as early as undergraduate medical education. Recent studies of Canadian medical learners revealed that 6.1–7.8% of medical students experienced suicidal ideation (SI) in the past 12 months.[3-4] This rate exceeds that measured in other post-secondary graduates in Canada (3.2%).[3] SI is even more prevalent in residents, with 4.3–33.3% considering suicide during residency or in the recent past.[4-8] In fact, suicide was the second most prevalent cause of U.S. resident death from 2000 to 2014.[9] This is not a new problem—in samples as early as the 1940s, suicide was the second leading cause of death in medical students,[10] representing over half a century since the recognition of this issue.

Although medical learner suicide is a relatively uncommon event, it is one that has devastating and long-lasting effects on students, as well as their family and friends, and represents an unquantifiable loss of future potential.

To explore the initiatives currently in place to support medical learners, we reviewed the websites of the six Ontario medical schools and evaluated the availability of mental health resources, as well as the curricular integration of wellness topics. All Ontario medical schools provide students with confidential counseling services and links to various external resources, including crisis helplines. Additionally, all medical school curricula make at least one reference to physician health and wellness, with certain schools dedicating mandatory interactive sessions to mindfulness and resilience. Several schools offer formal peer support programs for medical learners. For example, in 2021, the University of Ottawa started the "Peer Support Program" for residents and physicians which uses a reach-out approach to contact clinicians who have experienced recent adverse patient outcomes or other stressful events.[12] Similarly, the Northern Ontario School of Medicine runs a Peer Support Network, a student-run initiative that allows students to choose a Peer Supporter based on lived experiences and the type of support desired.[13] Although these integrated supports sound promising, there is a need for formal evaluation of the available resources and utilization by students, as well as development of additional initiatives to best support medical learners' wellness needs and access to appropriate mental health services.

Our position paper will explore the problem of suicidal ideation and death by suicide in medical learners, as well as interventions aimed at reducing suicide risk. Our recommendations are based on a scoping review of peer reviewed literature from Canada and the United States on this topic. Please see Table 1 for the specific inclusion and exclusion criteria. Databases searched included MEDLINE, Embase, and PsycInfo. We screened 623 abstracts and 138 full texts, leaving us with 107 eligible articles, and ultimately included data from 44 eligible articles to help inform and support our recommendations (Figure 1).

Figure 1. Paper selection flow chart.

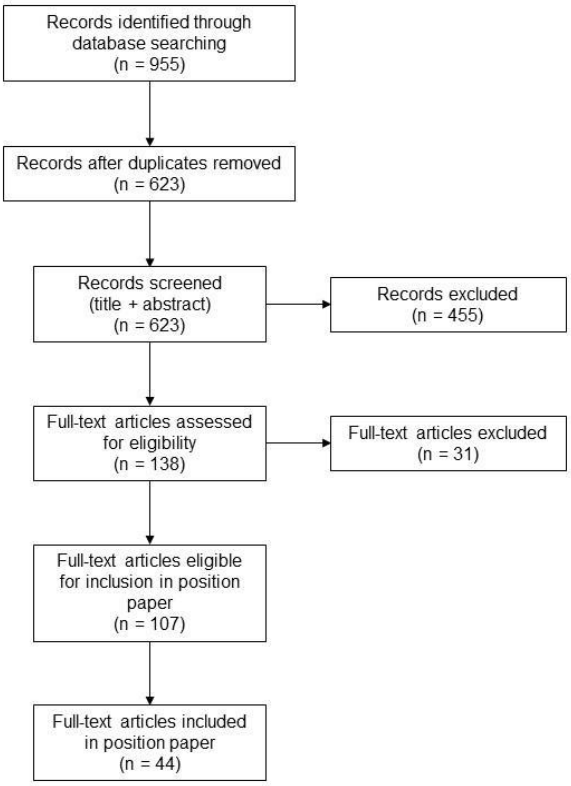

Table 1. Inclusion and exclusion criteria for scoping review.

Inclusion Criteria	Exclusion Criteria
● Observational or interventional design; or commentary on the issue of suicide in medical students or interventions to reduce suicide risk ● Outcome measures include suicidal ideation, suicide attempts, or suicide completion ● Participants are Canadian or American medical students or medical residents	● Inclusion of physicians or faculty without subgroup analysis of medical students or residents ● Editorials, non-English texts

PRINCIPLES

We make our recommendations using the following guiding principles:

1. Medical schools and residency programs have a responsibility to promote learner wellness, in the interest of both learners' personal health outcomes as well as their ability to provide quality patient care.
2. Given the prevalence of SI in medical learners and its association with death by suicide, medical training programs should implement focused preventative and reactive measures aimed to support at-risk learners.

RECOMMENDATIONS

We recommend the following:

1. That medical schools implement anonymous screening strategies to identify students and residents at risk of suicide.

Universal screening programs should be developed for the identification of medical learners with risk factors for suicide to provide early referral to appropriate resources. One such program is in place at the University of California, San Diego (UCSD).[14-16] In this program, students, residents, and faculty are e-mailed an anonymous, confidential survey meant to screen for depression, SI, and other relevant risk factors. Respondents were stratified into tiers based on risk level. High risk individuals were encouraged to communicate with counselors online or schedule an in-person evaluation. Participants remained anonymous until they chose to meet with the counselor in person. In the program's first year at the UCSD, 32% of students and 33% of residents who used the screening tool spoke with a counselor. Out of the entire UCSD population, 3% of students and 2% of residents were referred to a mental health professional as a result of the screening.[16] Over 4 years, 6.7% of student respondents were referred for further psychiatric care, ten of whom were suicidal and previously not in treatment.[14] While longitudinal treatment outcomes have not yet been published, these findings highlight the success of such programs in increasing student and resident mental health service usage. The use of a similar screening program in Ontario universities would be expected to similarly increase the proportion of students accessing underutilized university counseling and psychological services.[4]

The implementation of anonymous screening programs would be important in the identification of students with risk factors for suicidality. In medical students, predictors of SI include entry into clerkship,[3] perceived stress,[17] debt,[18] single marital status,[18] burnout,[18-21] excessive alcohol use,[22-23] mistreatment,[24]

membership in a sexual or gender minority group,[25-26] history of accessing mental health care[27] and depressive symptoms.[18-19,28-29] In residents, SI is associated with self-reported medical error, increased work hours, decreased sleep, neuroticism, symptoms of depression and anxiety,[30] mistreatment,[31-33] and membership in a sexual or gender minority group.[31,34] The presence of these factors, elicited by the online screening tool, could be used to increase the index of suspicion for suicide risk, even in the absence of reported SI. Additionally, identification of students at higher risk would be expected to increase due to the confidential and widespread nature of the program.

Certain demographic characteristics are associated with increased SI, including sexual and gender minority (SGM) identities.[25-26,31,34] Heiderscheit and colleagues[31] found that LGBTQ+ residents were nearly twice as likely to report having thoughts of suicide, but that this relationship was eliminated after adjusting for mistreatment. It is important to avoid pathologizing differences in sexual and gender identity as causing increased suicide risk, though schools should be aware of these intersecting identities and the increased risk of suicidality carried by membership in certain minority groups. These findings further support the need to effectively capture learners' experiences of mistreatment in a confidential way, as variation in mistreatment was able to account for the association between SGM identity and suicidality.

Timing is another important factor to consider when it comes to screening efforts, to maximize both participation and effectiveness. Transition to clerkship and clinical education represent an important transition in medical learning with exposure to many new academic, interpersonal and emotional stressors. An increased frequency of screening during the transition to clerkship and throughout clinical education could optimize early detection of medical students at higher risk of suicide.[3,17] To increase participation in this important window of opportunity, Cheung and colleagues[35] recommend screening immediately after mandatory scheduled assessments, like written exams or objective structured clinical examinations (OSCEs). While exam performance is associated with emotional valence, their work showed that it does not affect residents' reports of SI and can be a valuable way to screen the greatest possible number of trainees.

2. That medical schools develop, implement, and evaluate targeted individual- and institution-level interventions to reduce suicide risk.

2.1) Development of interventions

It is important to address barriers to developing and enhancing wellness supports faced by medical education programs. Schutt and colleagues' [36] survey of North American medical school wellness directors identified a lack of financial, administrative, and faculty support as three leading obstacles. While multi-pronged interventions like the ones proposed by Thompson and colleagues[37] involve hiring new personnel and are thus more cost-intensive, others, like the virtual cognitive behavioural therapy (CBT) program used at Yale University and the University of Southern California (USC),[38] are relatively low-cost and can help circumvent financial barriers. Another obstacle in the development of programs is a lack of student interest.[36] In light of other findings, it is likely that a low awareness of the programs available has been misinterpreted as low interest.[39] However, a lack of engagement may also underscore a misalignment between learners' needs and the services provided, or other barriers including lack of time to engage in the programs. This further emphasizes a need to involve medical students and residents in the development of programs meant to reduce suicide risk in order to maximize learner engagement.

In our discussion of evidence-based approaches to suicide prevention, we define individual interventions as ones aimed at aiding individuals experiencing SI or empowering individuals to reduce suicide risk without addressing the systemic factors that contribute to learner distress. System-level interventions are those that combat learner suicide by directly acting on the upstream factors that contribute to suicide risk, such as financial burden or duty hour violations.

2.2a) Implementation of individual-level interventions

Interventions implemented by a US medical school and two university hospitals successfully decreased SI in medical students and first-year residents, respectively.[37,38] The University of Hawaii John A. Burns

School of Medicine took a multi-faceted approach to combating SI in medical students, featuring a greater variety of counseling options for students, annual faculty education on depression including coaching on how to ask students about depression if concern arises, and an addition to the medical school curriculum focused on student wellbeing.[37] Following this intervention, the school reported a 10-fold decrease in SI experienced by third-year medical students, although it is important to note that the data before and after the program implementation came from two different medical school classes. Yale University and USC introduced a simpler intervention—incoming first-year residents were randomly assigned to either participate in a web-based cognitive behavioural therapy (wCBT) program for depression or receive e-mails providing general information about depression, symptom recognition, and community resources. Most of the residents assigned to the wCBT group completed at least one of four modules, demonstrating a general willingness to participate in this intervention. Moreover, residents in the wCBT arm were 60% less likely to experience SI.[38] Aspects of these interventions including increased individual counseling, enhancement of medical student resources related to wellness and coping strategies and utilization of online CBT sessions could be incorporated into Ontario medical school wellness portfolios to further support medical learners.

Mental health services provided at different medical schools play an important role in supporting student wellness. One study found that in a group of students who sought treatment for mental or emotional concerns, the most commonly accessed health-care provider was their primary care provider, highlighting the importance of encouraging all medical learners to have a family doctor.[4] In the same study, university counseling services were the second most frequently accessed services for mental and emotional problems.[4] In accordance with these findings, improvement of school-associated counseling programs is a key aspect of several interventions successful in reducing SI.[14,16,40] Some of the most common barriers to utilization of mental health services by medical learners include lack of free time, concerns about confidentiality, and fear of stigma.[41-43] Concerns regarding lack of free time can be addressed by giving students the option to take dedicated time off to attend mental health appointments. Concerns related to confidentiality can be addressed via advertising that emphasizes both the confidential nature of the appointments and the separation of wellness services from all academic aspects of the program. Efforts to increase compassion for and reduce stigma against individuals with mental health issues should be interwoven into both the wellness curriculum and general medical training. Depressed students—those who would most benefit from mental health services—were most concerned about a lack of confidentiality[42] and were most likely to endorse stigma against depression.[29] These findings highlight the importance of addressing these two issues in promotion efforts for support services.

The interventions discussed thus far focus on individuals, with the goal of either identifying at-risk learners or proactively teaching trainees the skills needed to cope with the innate demands of a career in medicine. However, more upstream approaches should be developed to address the root of the problem: the prevailing academic and workplace culture.

2.2b) Implementation of systems-level interventions

Canadian medical education programs can develop interventions aimed at managing upstream risk factors for SI. Some predictors of SI in medical students, like debt, are modifiable. For example, the incorporation of financial literacy into the mandatory medical school curriculum, as was done at McMaster University, could help reduce financial burden and associated stress. In residents, SI is associated with self-reported medical error, increased work hours, and decreased sleep.[30] Structural changes in residency programs, such as restrictions on hours or workflow redesign aimed at reducing medical errors could help decrease SI.[6,30]

Learner mistreatment is another issue that needs to be addressed at an organizational level. Mistreatment in all its forms is associated with higher rates of SI in both medical students and residents.[24,31-33] A survey of general surgery residents found a dose-response effect, where an increasing frequency of mistreatment was associated with increasing frequency of SI.[32] Certain demographics were found to be subjected to mistreatment more frequently than others—the difference was in fact sufficient to account for the higher levels of SI in female and LGBTQ+ residents.[31-32] While the primary sources of mistreatment varied based on the type of mistreatment and across studies, residents tended to face the

most discrimination and abuse from patients, patients' families, and attendings,[31-33] while medical students were mistreated by patients and clinical preceptors, including residents.[24] Medical schools should ensure that protocols are in place for reporting and responding to learner mistreatment. All healthcare providers in hospitals associated with the university should complete training focused on the workplace code of conduct as well as bystander training that provides guidance regarding the appropriate response to mistreatment witnessed in the workplace.[31] While discrimination or abuse by patients is difficult to limit at an institutional level, learners should receive training on how to respond and how to extricate themselves from a harmful interaction. Finally, schools should use reports made by learners to regularly assess the prevalence, types, and sources of mistreatment and by extension, the effectiveness of interventions employed to limit it.

Lastly, medical student well-being is largely affected by the views and actions of staff and faculty. One study showed that non-supportive medical school faculty was the most predictive factor for medical student distress,[44] while another found that 54% of wellness programming at U.S. and Canadian medical schools was led by medical school staff.[36] These findings demonstrate how crucial staff and faculty are to the well-being of their students. Therefore, we recommend that schools implement formal programs to educate faculty about the signs of depression and risk factors for suicide specific to medical trainees, along with practical skills on how to talk to students expressing these symptoms and direct them to the appropriate resources.[7,37] These issues could be raised through faculty-wide workshops, along with their integration into council and department meetings.[45]

2.3) Evaluation of interventions

All individual wellness supports or institutional changes meant to improve learner wellness should be routinely evaluated for effectiveness, utilization, and learners' overall perceptions of these programs. Changes in SI and other metrics of distress, as measured by anonymous screening programs, would provide insight into the effectiveness of the implemented programs. These anonymous surveys could also elicit learners' beliefs about the accessibility and utility of support services and barriers to engagement. Focus groups with stakeholders, including faculty and learners at different stages of their training, could offer a more detailed understanding of gaps between wellness offerings and student needs. Routine evaluation would not only provide evidence of efficacy, but would allow wellness committees to tailor services to changing learner populations and allow for comparison to strategies in use at other schools and in different populations.

In addition, we recommend that medical schools keep records of student and resident suicides. Most recent data shows that only seven of Canada's seventeen medical schools reported keeping records of student deaths.[46] Ideally, anonymized data would be shared across Canadian medical schools to enable monitoring of trends in suicide rates and to guide suicide prevention strategies.[47]

3. That medical schools develop a coordinated and compassionate response policy in the event of a learner suicide.

Exposure to suicide loss has long been known to increase one's risk of death by suicide.[48] To our knowledge, this association has not been explicitly established in medical student or resident populations. However, a review of the research on suicidal ideation in Canadian medical residents is suggestive of such a relationship. A survey of family medicine residents in British Columbia (BC) reported that 33.3% of participants experienced SI during residency.[5] This is an alarmingly high rate, especially compared to other Canadian research in similar populations, which reports that 4.3-15% of residents experienced SI during residency or in the recent past.[6-8] Notably, there was a resident suicide in the BC family medicine program only one year prior to survey distribution. As there is no data in this population prior to the suicide, no causal attribution can be made, but suicide death exposure might reasonably account for the increased rate of SI reported in the study.

There are clearly many confounding factors, including the specialty of residency program, and academic and workplace culture. However, these findings, coupled with the known association between exposure to

suicide and suicidal behaviour in the general population, lend support to our recommendation that each medical school develop a coordinated response policy for a student or resident suicide. As of 2018, only 10 out of 17 Canadian medical schools had such a policy in place.[46] A coordinated, compassionate response could include provision of immediate bereavement support for affected community members and long-term follow-up at anniversaries, as well as a temporary increase in screening for suicide risk and promotion of help-seeking behaviour.[49]

Going beyond addressing immediate bereavement support for learner experiences with peer suicide, we encourage medical schools to consider expanding their coordinated plans to include support for learner experiences with all peer death in general. This broad inclusion for a coordinated, compassionate response may not be fully feasible initially but can ultimately be comprehensive for diverse bereavement needs among learners in the future.

IMPLEMENTATION STRATEGY

Due to the complex and multifaceted nature of approaching suicide risk screening, interventions, and supports, we acknowledge the imminent challenges involved in implementing or adapting the suggested recommendations in the Ontario context. Nonetheless, for the critical issue of SI in the medical community, recommendations may be more successful in their implementations if we consider both broad and specific strategies in addition to incorporating these recommendations.

The recommendations listed below are **optional** ideas for OMSA to consider.

Broad, overarching strategies for OMSA to consider:

- Involving learner input in the development, implementation, and evaluation steps of any program or initiative for medical learners.
- Incorporating opportunities for equity, diversity, inclusion, and decolonization (EDID) where possible through the involvement of EDID representatives and diverse stakeholders.
- Being cautious of potential adverse consequences or potential for harm when approaching initiatives, representatives, and learners for suicide-related discussions by assessing the potential negative impact and unintended consequences of programs and initiatives prior to design and implementation. This should be done with appropriate EDID input and stakeholder representation.

Specific strategies for OMSA to consider:

- For recommendation 1: Measure the baseline risk level for students at different schools. Liaise with the student wellness programs at schools to advocate for regular screening and track ongoing changes in learner distress to make timely modifications to ensure screening and service provision remain appropriate for changing learner populations. Potentially develop a task force to investigate current anonymous online screening tools for medical learners and engage with relevant stakeholders to assess feasibility of province-wide implementation.
- For recommendation 2: Assess the participation rate and uptake of existing learner targeted modules and programs. Evaluate their existing impact, costs, and feedback. Involve learners with appropriate EDID representation in curricula modification and identifying prioritized areas.
- For recommendation 3: Organize a list of existing support-based policies and assess their scope of impact (e.g. policies and resources pertaining to personal days versus institution-wide scheduling changes when acknowledging a suicide in the community). OMSA may be helpful in connecting with the broader community (via social media) to promote awareness of community supports (or lack thereof) to further advocacy for change. OMSA can also help advocate the evidence and need for a coordinated, compassionate response for immediate bereavement support.

CONCLUSION

In summary, the prevalence of SI and dangerous progression to death by suicide are highly relevant aspects of mental health for medical learners and residents. Our position paper explores the problem of SI and death by suicide as well as existing interventions offered by Ontario medical schools. Based on a comprehensive review of relevant literature from Canada and the United States, we have provided three key recommendations for reducing learner suicide risk that align with guiding OMSA principles. These recommendations focus on anonymous screening strategies, a comprehensive approach to targeted interventions, and a coordinated and compassionate response for peers after a suicide in the medical community. Although critically relevant, approaching the task of reducing suicide risk among medical learners and residents can seem daunting. For this position paper, we have outlined a few broad and recommendation-specific strategies with suggested OMSA involvement for first steps towards implementation in the future.

REFERENCES

1. Dutheil F, Aubert C, Pereira B, et al. Suicide among physicians and health-care workers: A systematic review and meta-analysis. *PLoS One*. 2019;14(12). doi:10.1371/journal.pone.0226361

2. Schernhammer ES, Colditz GA. Suicide rates among physicians: A quantitative and Gender Assessment (meta-analysis). *Am J Psychiatry.* 2004;161(12):2295–302.

3. Maser B, Danilewitz M, Guérin E, Findlay L, Frank E. Medical student psychological distress and mental illness relative to the general population. *Acad Med.* 2019;94(11):1781-1791. doi:10.1097/acm.0000000000002958

4. Matheson KM, Barrett T, Landine J, McLuckie A, Soh NL-W, Walter G. Experiences of psychological distress and sources of stress and support during medical training: A survey of medical students. *Acad Psychiatry.* 2015;40(1):63-68. doi:10.1007/s40596-015-0395-9

5. Laramée J, Kuhl D. Suicidal ideation among family practice residents at the University of British Columbia. *Can Fam Physician.* 2019;65(10):730-735.

6. Liu R, Van Aarsen K, Sedran R, Lim R. A national survey of burnout amongst Canadian Royal College of Physicians and Surgeons of Canada emergency medicine residents. *Can Med Educ J.* 2020. doi:10.36834/cmej.68602

7. Taher A, Hart A, Dattani ND, et al. Emergency medicine resident wellness: Lessons learned from a national survey. *CJEM.* 2018;20(5):721-724. doi:10.1017/cem.2018.416

8. CMA 2021 National Physician Health Survey. Canadian Medical Association.. https://www.cma.ca/sites/default/files/2022-08/NPHS_final_report_EN.pdf. Published August 24, 2022. Accessed May 3, 2023.

9. Yaghmour NA, Brigham TP, Richter T, et al. Causes of death of residents in ACGME-accredited programs 2000 through 2014. *Acad Med.* 2017;92(7):976-983. doi:10.1097/acm.0000000000001736

10. Simon HJ. Mortality among medical students, 1947-1967. *Acad Med.* 1968;43(11):1175-1182. doi:10.1097/00001888-196811000-00012

11. Kessler RC, Borges G, Walters EE. Prevalence of and risk factors for lifetime suicide attempts in the National Comorbidity Survey. *Arch Gen Psychiatry*. 1999;56(7):617-626. doi:10.1001/archpsyc.56.7.617

12. Peer Support Program FAQs. University of Ottawa, Faculty of Medicine. https://www.uottawa.ca/faculty-medicine/sites/g/files/bhrskd401/files/2022-06/peer_support_program_faqs_0.pdf. Published 2021. Accessed February 18, 2023.

13. Learner Support. NOSM University. https://culture.nosm.ca/learner-support/. Accessed February 18, 2023.

14. Downs N, Feng W, Kirby B, et al. Listening to depression and suicide risk in medical students: The Healer Education Assessment and Referral (HEAR) program. *Acad Psychiatry.* 2014;38(5):547-553. doi:10.1007/s40596-014-0115-x

15. Haskins J, Carson JG, Chang CH, et al. The Suicide Prevention, Depression Awareness, and clinical engagement program for faculty and residents at the University of California, Davis Health System. *Acad Psychiatry.* 2015;40(1):23-29. doi:10.1007/s40596-015-0359-0

16. Moutier C, Norcross W, Jong P, et al. The Suicide Prevention and Depression Awareness Program at the University of California, San Diego School of Medicine. *Acad Med.* 2012;87(3):320-326. doi:10.1097/acm.0b013e31824451ad

17. Compton MT, Carrera J, Frank E. Stress and depressive symptoms/dysphoria among US medical students. *J Nerv Ment Dis.* 2008;196(12):891-897. doi:10.1097/nmd.0b013e3181924d03

18. Dyrbye LN, Thomas MR, Massie FS, et al. Burnout and suicidal ideation among U.S. medical students. *Ann Intern Med*. 2008;149(5):334. doi:10.7326/0003-4819-149-5-200809020-00008

19. Dyrbye LN, Harper W, Durning SJ, et al. Patterns of distress in US medical students. *Med Teach.* 2011;33(10):834-839. doi:10.3109/0142159x.2010.531158

20. Hewitt DB, Ellis RJ, Hu Y-Y, et al. Evaluating the association of multiple burnout definitions and thresholds with prevalence and outcomes. *JAMA Surg.* 2020;155(11):1043. doi:10.1001/jamasurg.2020.3351

21. Rajapuram N, Langness S, Marshall MR, Sammann A. Medical students in distress: The impact of gender, race, debt, and disability. *PLoS One.* 2020;15(12). doi:10.1371/journal.pone.0243250

22. Ayala EE, Roseman D, Winseman JS, Mason HRC. Prevalence, perceptions, and consequences of substance use in medical students. *Med Educ Online.* 2017;22(1):1392824. doi:10.1080/10872981.2017.1392824

23. Martinez S, Tal I, Norcross W, et al. Alcohol use in an academic medical school environment: A UC San Diego Healer Education Assessment and Referral (HEAR) Report. *Ann Clin Psychiatry.* 2016;28(2):85-94.

24. Frank E, Carrera JS, Stratton T, Bickel J, Nora LM. Experiences of belittlement and harassment and their correlates among medical students in the United States: Longitudinal survey. *BMJ.* 2006;333(7570):682. doi:10.1136/bmj.38924.722037.7c

25. Madrigal J, Rudasill S, Tran Z, Bergman J, Benharash P. Sexual and gender minority identity in Undergraduate Medical Education: Impact on experience and career trajectory. *PLoS One.* 2021;16(11). doi:10.1371/journal.pone.0260387

26. Schad A, Layton RL, Ragland D, Cook JG. Mental health in medical and biomedical doctoral students during the 2020 covid-19 pandemic and racial protests. *eLife.* 2022;11. doi:10.7554/elife.69960

27. Jupina M, Sidle MW, Rehmeyer Caudill CJ. Medical Student Mental Health during the COVID-19 pandemic. *Clin Teach*. 2022;19(5). doi:10.1111/tct.13518

28. Goebert D, Thompson D, Takeshita J, et al. Depressive symptoms in medical students and residents: A Multischool Study. *Acad Med.* 2009;84(2):236-241. doi:10.1097/acm.0b013e31819391bb

29. Schwenk TL, Davis L, Wimsatt LA. Depression, stigma, and suicidal ideation in medical students. *JAMA.* 2010;304(11):1181. doi:10.1001/jama.2010.1300

30. Malone TL, Zhao Z, Liu T-Y, Song PX, Sen S, Scott LJ. Prediction of suicidal ideation risk in a prospective cohort study of medical interns. *PLoS One.* 2021;16(12). doi:10.1371/journal.pone.0260620

31. Heiderscheit EA, Schlick CJ, Ellis RJ, et al. Experiences of LGBTQ+ residents in US general surgery training programs. *JAMA Surg.* 2022;157(1):23. doi:10.1001/jamasurg.2021.5246

32. Hu Y-Y, Ellis RJ, Hewitt DB, et al. Discrimination, abuse, harassment, and burnout in surgical residency training. *N Engl J Med*. 2019;381(18):1741-1752. doi:10.1056/nejmsa1903759

33. Zhang LM, Ellis RJ, Ma M, et al. Prevalence, types, and sources of bullying reported by US general surgery residents in 2019. *JAMA.* 2020;323(20):2093. doi:10.1001/jama.2020.2901

34. Lall MD, Bilimoria KY, Lu DW, et al. Prevalence of discrimination, abuse, and harassment in emergency medicine residency training in the US. *JAMA Netw Open.* 2021;4(8). doi:10.1001/jamanetworkopen.2021.21706

35. Cheung EO, Hu Y-Y, Jones A, et al. Assessing resident well-being after the ABSITE: A bad time to ask? *Ann Surg Open.* 2022;3(4). doi:10.1097/as9.0000000000000209

36. Schutt A, Chretien KC, Woodruff JN, Press VG, Vela M, Lee WW. National Survey of Wellness Programs in U.S. and Canadian Medical Schools. *Acad Med.* 2021;96(5):728-735. doi:10.1097/acm.0000000000003953

37. Thompson D, Goebert D, Takeshita J. A program for reducing depressive symptoms and suicidal ideation in medical students. *Acad Med.* 2010;85(10):1635-1639. doi:10.1097/acm.0b013e3181f0b49c

38. Guille C, Zhao Z, Krystal J, Nichols B, Brady K, Sen S. Web-based cognitive behavioral therapy intervention for the Prevention of Suicidal Ideation in medical interns. *JAMA Psychiatry.* 2015;72(12):1192. doi:10.1001/jamapsychiatry.2015.1880

39. Levy AB, Nahhas RW, Sampang S, et al. Characteristics associated with depression and suicidal thoughts among medical residents: Results from the DEPRESS-Ohio study. *Acad Psychiatry.* 2019;43(5):480-487. doi:10.1007/s40596-019-01089-9

40. Seritan AL, Rai G, Servis M, Pomeroy C. The Office of Student Wellness: Innovating to Improve Student Mental Health. *Acad Psychiatry.* 2014;39(1):80-84. doi:10.1007/s40596-014-0152-5

41. Eckleberry-Hunt J, Lick D. Physician depression and suicide: A shared responsibility. *Teach Learn Med.* 2015;27(3):341-345. doi:10.1080/10401334.2015.1044751

42. Givens JL, Tjia J. Depressed medical students' use of mental health services and barriers to use. *Acad Med.* 2002;77(9):918-921. doi:10.1097/00001888-200209000-00024

43. Van Remortel B, Dolan E, Cipriano D, McBride P. Medical student wellness in Wisconsin: Current trends and future directions. *WMJ.* 2018;117(5):211-213.

44. Langness S, Rajapuram N, Marshall M, Rahman AS, Sammann A. Risk factors associated with student distress in medical school: Associations with faculty support and availability of wellbeing resources. *PLoS One*. 2022;17(4). doi:10.1371/journal.pone.0265869

45. MacDonald NE, Davidson S. The wellness program for medical faculty at the University of Ottawa: A work in progress. *CMAJ.* 2000;163(6):735-738.

46. Zivanovic R, McMillan J, Lovato C, Roston C. Death by suicide among Canadian Medical Students: A National Survey-based study. *Can J Psychiatry.* 2018;63(3):178-181. doi:10.1177/0706743717746663

47. Laitman BM, Muller D. Medical student deaths by suicide. *Acad Med.* 2019;94(4):466-468. doi:10.1097/acm.0000000000002507

48. Maple M, Cerel J, Sanford R, Pearce T, Jordan J. Is Exposure to Suicide Beyond Kin Associated with Risk for Suicidal Behavior? A Systematic Review of the Evidence. *Suicide Life Threat Behav*. 2017;47(4):461-474. doi:10.1111/sltb.12308

49. Hill MR, Goicochea S, Merlo LJ. In their own words: Stressors facing medical students in the Millennial Generation. *Med Educ Online.* 2018;23(1):1530558. doi:10.1080/10872981.2018.1530558