

Burnout and Wellness in the College of Medicine at Northeast Ohio Medical University

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ABSTRACT

Burnout is a syndrome of professional distress defined by symptoms of emotional exhaustion, depersonalization, and a sense of reduced personal accomplishment. Previous surveys (Wellness Surveys) at Northeast Ohio Medical University (NEOMED) seemed to have demonstrated low scores in the wellness categories. As such, we sought to investigate further the frequency and factors of medical student burnout symptoms, the quality of medical student wellness, and contributing stressors at NEOMED. Over three weeks, an anonymous 8-question survey was sent out via e-mail to all NEOMED College of Medicine students. This survey included a novel scale created by the authors to measure burnout, wellness, and contributing stressors. The survey was done on Qualtrics SM Survey software and was statistically analyzed by class using Microsoft Excel. The survey was completed by 166 students (participation = 28%). Results demonstrated statistically significant differences in burnout and multiple components of wellness when stratified by class. Burnout and suboptimal wellness were most severe in preclinical (M1-M2) years. Groups rating higher frequencies of burnout also rated lower qualities of wellness. Nearly 50% of all respondents feel the challenge of medical school was more difficult than expected. At NEOMED, peak burnout frequencies and suboptimal wellness ratings are in the preclinical years. Groups that scored higher frequencies of burnout also scored poorer on wellness ratings. A systematic approach dedicated to promoting wellness at NEOMED may lead to lower frequencies of burnout.

Keywords: Burnout, Wellness, Education, Mental Health

INTRODUCTION

Burnout is a syndrome of professional distress defined by symptoms including emotional exhaustion, depersonalization, and a reduced sense of personal accomplishment (1,2). This syndrome is highly prevalent in the medical field, affecting many physicians and physician trainees in the United States. Emerging research shows that nearly 50% of medical students, residents, and attending physicians in the US have experienced burnout; these rates are significantly higher than those observed in the general US population (2). Burnout has been linked to increased risk of anxiety, depression, and medical error (3,4). In a profession dedicated to caring for others, high

rates of burnout may threaten to compromise compassionate and effective healthcare. Thus, burnout is an issue that requires close investigation to reveal where and how safeguards may be implemented at all levels. For medical providers, burnout may begin during the first years of medical training (5). As such, it is important to consider intervention at this stage.

Medical student wellness is a topic of increasing discussion nationwide. Wellness encompasses mental, physical, and emotional health (6). It has been shown to be a quality indicator that may inversely correlate to levels of burnout (6). The Liaison Committee for Medical Education (LCME) aids in the oversight of allopathic

medical student education. The LCME Standard 12.3 requires that “A medical school has in place an effective system of personal counseling for its medical students that includes programs to promote their well-being and to facilitate their adjustment to the physical and emotional demands of medical education” (7). Specialty training following medical school is largely governed by the Accreditation Council for Graduate Medical Education (ACGME). ACGME has a growing recognition that “Psychological, emotional, and physical well-being are critical in the development of the competent, caring, and resilient physician and require proactive attention to life inside and outside of medicine. Well-being requires that physicians retain the joy in medicine while managing their real-life stresses” (8). Every residency seeking ACGME accreditation must have “policies and programs that encourage optimal resident and faculty member well-being” (8).

The individual components of wellness (mental health, physical health, and emotional health) can significantly contribute to medical students’ quality of life, academic performance, and clinical performance (9). For example, inadequate sleep, one of the physical health subcomponents of wellness, can contribute to medical error, depreciating test results, and cognitive decline (9). Within the wellness subcomponent - emotional health, a strong sense of purpose has been linked to longer, happier, and more fulfilled lives (10). During postgraduate medical training concerns over the worsening of provider mental health led the ACGME to mandate screening for anxiety, depression, and substance abuse disorders. Assessing components of burnout and wellness as a means of developing strategies to reduce burnout and promote wellness should be a standard part of modern medical training.

Based in Rootstown, Ohio, NEOMED has a mission to train patient care-centered physicians while aiming to be a national leader in community-centered medicine. Over the last two years, NEOMED has begun a series of dramatic changes in its curriculum. Student feedback had led to a complete overhaul of the NEOMED curriculum deemphasizing lectures and markedly increasing interactive teaching modalities, especially Peer Instruction. NEOMED has also begun devoting more time and resources to wellness-related topics and has created several initiatives to improve student wellness such as opening a Center for Student Wellness and Counseling Services, offering wellness days for first-year students, and integrating wellness exercises and discussions in the curriculum. Despite these initiatives, concerns exist about the rates of burnout and wellness among the NEOMED medical student population.

The global pandemic of 2020 undoubtedly added considerable burdens to already stressed medical providers (11). Individuals throughout the world faced issues of fear, grief, and loss during a time of decreased social support. Medical professionals were not spared these personal struggles while caring for suffering individuals. All of these challenged individual providers’ senses of wellness and pushed toward ever higher and earlier rates of burnout (11). For medical students at NEOMED, there were unprecedented changes in training, evaluations, and applications for post-graduate training.

With increasing literature throughout the medical field regarding burnout and wellness, we sought to explore if burnout and suboptimal wellness are issues at NEOMED. To train high-quality patient care-centered physicians, we felt it would be advantageous to examine our environment and determine points of quality improvement. We believe that identifying of these possible issues can lead to targeted improvement projects and additional resource acquisition within NEOMED that can help improve student experience and wellness and ultimately prepare better physicians. We hypothesize that preclinical students will have the highest rates of burnout and that there will be a statistically significant difference between burnout symptom frequency and wellness quality depending on students’ class year.

METHODS

An anonymous 8-question survey was sent out via e-mail to all NEOMED College of Medicine students over a 3-week span. This survey included a novel scale created by the authors to measure burnout, wellness, and contributing stressors. The survey was done on Qualtrics SM Survey software and was statistically analyzed using Microsoft Excel. Data were analyzed by class. The eight questions administered through the survey are discussed below.

Our first objective is to identify burnout and related stressors at NEOMED by determining: 1. the frequency of burnout symptoms among NEOMED College of Medicine students, stratified by class (M1, M2, M3, M4) 2. The rating of wellness among NEOMED College of Medicine students, stratified by class (M1, M2, M3, M4). 3. Major stressors among NEOMED College of Medicine students 4. Expected challenges of medical school at NEOMED versus experienced challenges in medical school at NEOMED and, 5. Targeted improvement strategies based on identified areas within wellness and burnout subcomponents and at which specific stage of medical training they are occurring in. Our second objective is to measure the degree of burnout symptoms and the quality of wellness stratified by demographic

information to determine if any specific group of people is not achieving wellness and how we may help them.

*M1 denotes first-year medical student; M2 denotes second-year medical student etc. It is of note that M1-M2 spend most of their time doing preclinical work (classwork and lectures), and M3-M4 spend most of their time in the clinical setting with patients.

Data Collection

In order to conduct our primary and secondary aims, we created an online survey. To investigate burnout, we proposed measuring three categories of our own conception that we believe represent the dimensions of burnout: *detached*, *drained*, and *defeated*. We elected to use the novel terms detached, drained and defeated, as we felt these more sufficiently captured the feelings medical students at NEOMED would potentially experience in response to a year in medical school during the COVID-19 pandemic. These terms were defined within the survey (Fig. 1A). To investigate wellness, we separated it into three categories proposed by Wallace et al.: *mental*, *physical*, and *emotional* health (6). Likewise, as for burnout, we proposed to measure three subcategories of our conception (emotional, mental, physical health) for each larger category proposed by Wallace (9 subcategories total).

The questionnaire included eight questions and was administered in January 2021. Question 1 asked participants to provide separate ratings of the frequency they experienced the three components of burnout over the past two weeks (Fig. 1A). The two-week time frame was selected to provide insight into symptoms at that specific time range during the beginning of a medical school semester. Of the questions asked, Questions 2 through 4 asked participants to rate their satisfaction with each of the nine subcategories of wellness (Fig. 1B). The fifth question asked participants to compare the level of challenge they have experienced in medical school to what they expected before beginning (Fig. 1C). These first five survey questions were rated on scales of one to five, though the scales were distinct for each question (see Fig. 1). Herein, we refer to answers pertaining to burnout as *frequency ratings*, answers pertaining to wellness as *satisfaction ratings*, and answers pertaining to experienced versus expected challenge of medical school as *disparity ratings*. For this manuscript, students who reported frequency ratings of 4 or 5 for burnout metrics were considered at risk of burnout or experiencing burnout. Students who reported satisfaction ratings of 1 or 2 for wellness metrics were considered to have suboptimal wellness.

The sixth question sought to explore additional factors that may contribute to burnout. To accomplish this, we composed a list of nine potential stressors: finances, COVID-19, political climate, family issues, academic performance, relationships, health concerns, geographic environment, and discrimination. Participants were asked to select the three that were most contributory stressors at the time of participation. The final two questions were extended responses to allow further comments on the survey and potential areas of improvement for NEOMED. The estimated completion time was approximately 10 minutes.

After the survey, participants were asked to share limited demographic information, including race, gender, and class year. Completing this section was optional and did not affect prior responses in the overall analyses. Lastly, this project meets the criteria for a Quality Improvement project and did not require IRB approval.

Participation

The survey was distributed to all 599 students in the NEOMED College of Medicine. Participation was optional and anonymous (n =166; participation = 28%). The study was single blinded as the participants were aware of researchers, study goals, and the survey group they were in, and researchers were not aware of individual subject identities. The survey was open for three weeks from, January 18, 2021 to February 8, 2021, and was administered via Qualtrics SM Survey software. The timeframe of three weeks was selected to give participants ample time to take the survey and for the researchers to have the ability to address results promptly. The survey was emailed to all actively enrolled NEOMED College of Medicine students, with a weekly reminder email each of the following two weeks. The email also contained an information sheet that detailed the purpose of the survey, participation as being anonymous and optional, researcher contact information, the definitions of terms, and instructions for participation. No compensation was provided for survey completion.

Data analysis

The ordinal data collected for the first five survey questions was treated as numeric for the sake of comparative statistical analysis. We believe that this assumption is justified as the perceived difference between answer choices in the survey should be equal (e.g., the difference between very rarely and rarely should be equal to the difference between rarely and occasionally). Comparative statistical analyses were conducted within Microsoft Excel using a two-tailed, unpaired, two-sample t-test that assumed equal variances

and single factor analysis of variance tests as appropriate. A threshold of $p \leq 0.05$ was used to determine statistical significance. When single factor ANOVA testing

revealed statistical significance, post-hoc two-tailed t-testing was conducted to determine which classes specifically differed from one another.

A

☐ Q1 **NEOMED Student Wellness Survey**
AY 2020-21

 You should have received an email from Arjun Pandya on Monday, January 18, where he explains the background and purpose of this wellness survey.

If you have any questions about it, please read that message. You can also contact apandya@neomed.edu, adadlani@neomed.edu, or rwelton@neomed.edu.

Please note that any feedback you provide is completely anonymous. Be assured that you can speak freely.

The first set of questions is about burnout (emotional, physical or mental exhaustion). It focuses on three aspects of it, which are listed and defined here:

- *Detached* – feeling down, cynical, pessimistic, treating people as objects
- *Drained* – feeling tired, experiencing somatic symptoms, feeling drained
- *Defeated* – feeling incompetent, inefficient, inadequate

☐ Q2 During the past two weeks, I have felt:

 

	Very rarely	Rarely	Occasionally	Frequently	Very frequently
Detached	☐	☐	☐	☐	☐
Drained	☐	☐	☐	☐	☐
Defeated	☐	☐	☐	☐	☐

B

How would you rate your **mental health** in the following areas?

	Poor	Fair	Neutral	Good	Excellent
Overall mood	☐	☐	☐	☐	☐
Satisfaction with work/ life balance	☐	☐	☐	☐	☐
Ability to make and meet life goals	☐	☐	☐	☐	☐

How would you rate your **emotional health** in the following areas?

	Poor	Fair	Neutral	Good	Excellent
Quality of relationships	☐	☐	☐	☐	☐
Ability to take time for yourself	☐	☐	☐	☐	☐
Sense of purpose	☐	☐	☐	☐	☐

How would you rate your **physical health** in the following areas?

	Poor	Fair	Neutral	Good	Excellent
Sleep	☐	☐	☐	☐	☐
Diet	☐	☐	☐	☐	☐
Exercise	☐	☐	☐	☐	☐

C

How does the challenge of medical school (including lectures, exams, patient care and remote learning) you have experienced so far compare to what you expected medical school to be like?

☐ Much worse than expected

☐ Somewhat worse than expected

☐ About what I expected

☐ Somewhat easier than expected

☐ Much easier than expected

Figure 1. Sample survey scales and verbiage used in assessing numerical ratings. A) Novel scale created by authors to rate burnout based on frequency of feeling *Detached*, *Drained*, or *Defeated* over the past 2 weeks. B) Novel scale created by authors to rate overall quality of wellness determined by the 3 categories, *Mental Health*, *Emotional Health*, and *Physical Health*, and 9 subcategories of wellness. C) Question used to determine experienced versus expected challenge in medical school.

RESULTS

Respondents included 51 M1s, 36 M2s, 46 M3s, and 32 M4s. There were no significant findings between groups when stratified by race and gender.

Burnout

Survey respondent data about our three categories of burnout is summarized in Table 1. The feeling of being *drained* was most frequently experienced among M2 participants, with a mean frequency rating of 3.83 (Table 1A). Being *drained* was least frequently experienced among M4 participants, with a mean frequency rating of 3.00. The percentages of students experiencing/at risk of feeling *drained* in each class were 56.9% of M1s, 63.9% of M2s, 44.7% of M3s, and 38.7% of M4s. Feelings of *detachment* were most frequently experienced among M1 and M2 participants, with mean frequency ratings of 3.14 for both classes (Table 1B). Feelings of *detachment* were least frequently experienced among M4 participants, with a mean frequency rating of 2.31. The percentages of students experiencing/at risk of *detachment* in each class were 37.2% of M1s, 41.7% of M2s, 17.1% of M3s, and 18.8% of M4s. The feeling of *defeated* was most frequently experienced among M2 participants, with a mean frequency rating of 3.25 (Table 1C). The feeling of being *defeated* was least frequently experienced among M4 participants, with a mean frequency rating of 2.39. The percentages of students experiencing/at risk of feeling *defeated* in each class were 35.2% of M1s, 55.6% of M2s, 21.3% of M3s, and 16.2% of M4s.

ANOVA testing revealed statistically significant differences between mean group frequency ratings for all three categories of burnout: *drained* ($p=0.004$), *detached* ($p=0.006$), and *defeated* ($p=0.03$). Two-tailed *t* testing revealed the following pairs of individual classes to differ significantly for feelings of *detachment*: M1 and M3, M1 and M4, M2 and M3, M2 and M4; feeling *drained*: M1 and M3, M1 and M4, M2 and M4; feeling *defeated*: M2 and M3, M2 and M4.

Components of Wellness: Mental Health

Survey respondent data pertaining to our mental health categories are summarized in Table 2. The *overall mood* was highest among M4 participants, with a mean satisfaction rating of 3.72 (Table 2A). The *overall mood* was lowest among M2 participants, with a mean satisfaction rating of 2.86. The percentages of students reporting a suboptimal *overall mood* in each class were 33.3% of M1s, 41.7% of M2s, 31.9% of M3s, and 15.7% of M4s. *Satisfaction with work/life balance* was highest among M4 participants, with a mean satisfaction rating of

3.68 (Table 2B). *Satisfaction with work/life balance* was lowest among M2 participants, with a mean satisfaction rating of 2.47. The percentages of students reporting a suboptimal *work/life balance* in each class were 43.2% of M1s, 58.3% of M2s, 36.1% of M3s, and 16.2% of M4s. The *ability to make and meet life goals* was highest among M4 participants, with a mean satisfaction rating of 3.69 (Table 2C). The *ability to make and meet life goals* was lowest among M2 participants, with a mean satisfaction rating of 2.82. The percentages of students reporting a suboptimal *ability to make and meet life goals* in each class were 41.2% of M1s, 44.4% of M2s, 34.0% of M3s, and 15.7% of M4s.

ANOVA testing revealed statistically significant differences between mean group satisfaction ratings for all three categories of mental health: *overall mood* ($p=0.01$), *satisfaction with work/life balance* ($p<0.001$), and *the ability to make and meet life goals* ($p=0.01$). Post-hoc two-tailed *t* testing revealed the following pairs of individual classes to differ significantly for *overall mood*: M1 and M4, M2 and M4, M3 and M4; *satisfaction with work/life balance*: M1 and M4, M2 and M3, M3 and M4; *ability to make and meet life goals*: M1 and M4, M2 and M4, M3 and M4.

Components of Wellness: Emotional Health

Survey respondent data pertaining to our three categories of emotional health are summarized in Table 3. *Quality of relationships* was highest among M4 participants, with a mean satisfaction rating of 3.75 (Table 3A). *Quality of relationships* was lowest among M1 participants, with a mean satisfaction rating of 3.08. The percentages of students reporting a suboptimal *quality of relationships* in each class were 41.2% of M1s, 33.3% of M2s, 25.6% of M3s, and 18.8% of M4s. The *ability to take time for oneself* was highest among M4 participants, with a mean satisfaction rating of 3.84 (Table 3B). The *ability to take time for oneself* was lowest among M2 participants, with a mean satisfaction rating of 2.67. The percentages of students reporting a suboptimal *ability to take time for oneself* in each class were 41.1% of M1s, 52.8% of M2s, 31.9% of M3s, and 9.40% of M4s. *Satisfaction with a sense of purpose* was highest among M4 participants, with a mean satisfaction rating of 3.78 (Table 3C). *Satisfaction with a sense of purpose* was lowest among M2 participants, with a mean satisfaction rating of 3.11. The percentages of students reporting a suboptimal *sense of purpose* in each class were 39.2% of M1s, 36.1% of M2s, 25.5% of M3s, and 15.7% of M4s.

ANOVA testing revealed a statistically significant difference between mean group satisfaction ratings for the *ability to take time for oneself* ($p < 0.001$). The differences between mean group satisfaction ratings for *quality of relationships* ($p = 0.13$) and *sense of purpose* ($p = 0.057$)

were not statistically significant. Post-hoc two-tailed t testing revealed the following pairs of individual classes to differ significantly for *ability to take time for oneself*: M1 and M4, M2 and M4, M3 and M4.

A

Class	Drained (%)					Mean Rating	Number of Responses
	1	2	3	4	5		
M1	0.0	9.8	33.3	21.6	35.3	3.82	51
M2	8.3	5.6	22.2	22.2	41.7	3.83	36
M3	2.1	17.0	36.2	29.8	14.9	3.38	47
M4	16.1	19.4	25.8	25.8	12.9	3.00	32

B

Class	Detached (%)					Mean Rating	Number of Responses
	1	2	3	4	5		
M1	9.8	23.5	29.4	17.6	19.6	3.14	51
M2	16.7	22.2	19.4	13.9	27.8	3.14	36
M3	19.1	27.7	36.2	12.8	4.3	2.55	47
M4	34.4	25.0	21.9	12.5	6.3	2.31	32

C

Class	Defeated (%)					Mean Rating	Number of Responses
	1	2	3	4	5		
M1	15.7	27.5	21.6	17.6	17.6	2.94	51
M2	22.2	16.7	5.6	25.0	30.6	3.25	36
M3	23.4	23.4	32.0	14.9	6.4	2.57	47
M4	25.8	32.3	25.8	9.7	6.5	2.39	32

Table 1: Percent of NEOMED Medical Student Response for Symptoms of Burnout. Scale Based on Frequency of Symptoms Over Previous 2 Weeks: 1- Very Rarely, 2- Rarely, 3- Occasionally, 4- Frequently, 5-Very Frequently. A) Percent Drained, B) Percent Detached, C) Percent Defeated

A

Class	Overall Mood (%)					Mean Rating	Number of Responses
	1	2	3	4	5		
M1	17.6	15.7	21.6	39.2	5.9	3.00	51
M2	13.9	27.8	22.2	30.6	5.6	2.86	36
M3	6.4	25.5	17.0	44.7	6.4	3.19	47
M4	6.3	9.4	6.3	62.5	15.6	3.72	32

B

Class	Satisfaction Work/Life Balance (%)					Mean Rating	Number of Responses
	1	2	3	4	5		
M1	15.7	27.5	33.3	23.5	0.0	2.65	51
M2	33.3	25.0	11.1	22.2	8.3	2.47	36
M3	19.1	17.0	27.7	25.5	10.6	2.91	47
M4	9.7	6.5	12.9	48.4	22.6	3.68	32

C

Class	Ability to Make and Meet Life Goals (%)					Mean Rating	Number of Responses
	1	2	3	4	5		
M1	13.7	27.5	25.5	29.4	3.9	2.82	51
M2	25.0	19.4	13.8	27.8	13.9	2.86	36
M3	10.6	23.4	19.1	38.3	8.5	3.11	47
M4	9.4	6.3	12.5	50.0	21.9	3.69	32

Table 2: Percent of NEOMED Medical Student Respondents Rating Quality of Mental Health based on Overall Mood, Satisfaction with Work/Life Balance, and Ability to Make/Meet Life Goals. Scale: 1- Poor, 2- Fair, 3- Neutral, 4- Good, 5- Excellent. A) Overall Mood Rating Percent B) Satisfaction with Work Life Balance Rating Percent, C) Ability to Make and Meet Life Goals Rating Percent

A

Class	Sense of Purpose (%)					Mean Rating	Number of Responses
	1	2	3	4	5		
M1	15.7	23.5	11.8	31.4	17.6	3.12	51
M2	11.1	25.0	19.4	30.6	13.9	3.11	36
M3	6.4	19.1	12.8	38.3	23.4	3.53	47
M4	6.3	9.4	9.4	50.0	25.0	3.78	32

B

Class	Ability to Take Time for Yourself (%)					Mean Rating	Number of Responses
	1	2	3	4	5		
M1	17.6	23.5	29.4	25.5	3.9	2.75	51
M2	25.0	27.8	13.9	22.2	11.1	2.67	36
M3	12.8	19.1	23.4	31.9	12.8	3.13	47
M4	9.4	0.0	12.5	53.1	25.0	3.84	32

C

Class	Quality of Relationships (%)					Mean Rating	Number of Responses
	1	2	3	4	5		
M1	11.8	29.4	13.7	29.4	15.7	3.08	51
M2	19.4	13.9	8.3	44.4	13.9	3.19	36
M3	12.8	12.8	6.4	57.4	10.6	3.40	47
M4	12.5	6.3	12.5	31.3	37.5	3.75	32

Table 3: Percent of NEOMED Medical Student Respondents Rating Quality of Emotional Health. Scale: 1-Poor, 2-Fair, 3-Neutral, 4-Good, 5-Excellent. A) Quality of Relationships percent, B) Ability to Take Time for Yourself percent, C) Sense of Purpose percent

Components of Wellness: Physical Health

Survey respondent data pertaining to our three categories of physical health are summarized in Table 4. Satisfaction with *diet* was highest among M3 participants, with a mean satisfaction rating of 3.11 (Table 4A). Satisfaction with *diet* was lowest among M2 participants, with a mean satisfaction rating of 2.83. The percentages of students reporting a suboptimal *diet* in each class were 41.2% of M1s, 41.6% of M2s, 36.1% of M3s, and 31.2% of M4s. Satisfaction with *sleep* was highest among M4 participants, with a mean satisfaction rating of 3.22 (Table 4B). Satisfaction with *sleep* was lowest among M1 participants, with a mean satisfaction rating of 2.65. The percentages of students reporting suboptimal *sleep* in each class were 45.1% of M1s, 41.7% of M2s, 40.4% of M3s, and 28.2% of M4s. Satisfaction with *exercise* was highest among M4 participants, with a mean satisfaction rating of 2.75 (Table 4C). Satisfaction with *exercise* was lowest among M1 participants, with a mean satisfaction rating of 2.41. The percentages of students reporting suboptimal *exercise* in each class were 53.0% of M1s, 41.7% of M2s, 49.0% of M3s, and 43.8% of M4s.

ANOVA testing revealed there to be no statistically significant differences between mean group satisfaction ratings for all three categories of physical health: sleep ($p=0.17$), diet ($p=0.70$), and exercise ($p=0.62$).

Experienced vs. Expected Challenge

Survey respondent data pertaining to *experienced versus expected challenges* in medical school is summarized in Table 5. The disparity between *experienced versus expected challenge* was least severe among M1 participants, with a mean disparity rating of 2.6. The disparity between *experienced versus expected challenge* was most severe among M4 participants, with a mean disparity rating of 2.34. ANOVA testing revealed there to be no statistically significant differences between mean group disparity ratings ($p=0.65$).

DISCUSSION

Burnout, Wellness, and Stressor Analysis

In this study of burnout and wellness in the NEOMED College of Medicine, we sought to investigate further the frequency and factors of medical student burnout symptoms, the quality of medical student wellness, and contributing stressors at NEOMED. We were able to discover several notable findings. First, all three symptoms of burnout are most frequently experienced in the first two (preclinical) years of medical school. Second,

all three mental health components were significantly different when separated by class, being most commonly ranked as suboptimal by the M2 class. Third, the only emotional health factor that differed significantly between classes was the *ability to take time for oneself*. There were no statistically significant differences in physical health between classes, however, a high percentage of all three factors were ranked suboptimal. Finally, there were no statistically significant differences between experienced and expected challenges of medical school amongst the classes, however, a high percentage of respondents rated their experience as somewhat or much more challenging than expected. Thus, our findings suggest that the preclinical stage at NEOMED may contribute to a higher frequency of burnout symptoms and poorer mental health quality. M1s and M2s experience significantly greater burnout symptoms than M3/M4s. Additionally, rating their experience as much more challenging/somewhat more challenging than expected (49% of M1 respondents, 50% of M2 respondents, 52% of M3 respondents, and 57% of M4 respondents) is a concerning finding.

Respondents were asked for factors that might be worsening burnout and suggestions that might improve resilience. Preclinical students' suggestions regarding burnout include: isolation (secondary to pandemic), a newly redesigned and intense curriculum, and the USMLE Step 1 Exam. Although the new curriculum had been instituted because of previous students' desire for more active and interactive learning experiences, the current students had concerns about this approach. The M1 class disliked the frequent graded quizzes that accompanied the Peer Instruction methodology. The M2 class suggested that mandatory class and lecture work interfered with preparation for the USMLE Step 1 Exam. These comments likely correlate with "Academic Performance" being listed as the most significant stressor for these classes. Clinical students experiencing burnout at less frequent rates may be due to different demands based on their stage of training and/or improved coping strategies.

In the wellness categories, all three subcomponents of *mental health* - overall mood, satisfaction with work/life balance, and ability to make/meet life goals - showed a statistically significant difference between classes [*overall mood* ($p=0.01$), *satisfaction with work/life balance* ($p<0.001$), and *the ability to make and meet life goals* ($p=0.01$)], with lower scores in the preclinical years.

A

Class	Diet (%)					Mean Rating	Number of Responses
	1	2	3	4	5		
M1	21.6	19.6	17.6	35.3	5.9	2.84	51
M2	19.4	22.2	19.4	33.3	5.6	2.83	36
M3	10.6	25.5	19.1	31.9	12.8	3.11	47
M4	15.6	15.6	28.1	37.5	3.1	2.97	32

B

Class	Sleep (%)					Mean Rating	Number of Responses
	1	2	3	4	5		
M1	25.5	19.6	19.6	35.3	0.0	2.65	51
M2	25.0	16.7	16.7	41.7	0.0	2.75	36
M3	17.0	23.4	10.6	40.4	8.5	3.00	47
M4	9.4	18.8	15.6	53.1	3.1	3.22	32

C

Class	Exercise (%)					Mean Rating	Number of Responses
	1	2	3	4	5		
M1	41.2	11.8	17.6	23.5	5.9	2.41	51
M2	38.9	2.8	30.6	22.2	5.6	2.53	36
M3	27.7	21.3	14.9	23.4	12.8	2.72	47
M4	25.0	18.8	18.8	31.3	6.2	2.75	32

Table 4: Percent of NEOMED Medical Student Respondents Rating Quality of Physical Health. Scale: 1-Poor, 2-Fair, 3-Neutral, 4-Good, 5-Excellent. A) Quality of Sleep percent B) Quality of Diet percent C) Quality of Exercise

Class	Experienced vs. Expected Challenge (%)					Mean Rating	Number of Responses
	1	2	3	4	5		
M1	11.8	37.2	33.3	13.7	3.90	2.60	51
M2	22.2	27.8	30.6	13.9	5.50	2.53	36
M3	10.7	41.3	39.1	8.7	0.00	2.46	47
M4	12.5	43.8	40.6	3.1	0.00	2.34	32

Table 5: Percent of NEOMED Medical Student Respondents Rating Experienced vs Expected Challenge of Medical School (based on lectures, exams, patient care and remote learning). Scale: 1- Much Worse Than Expected 2-Somewhat Worse than Expected, 3-About What I Expected, 4-Somewhat Easier Than Expected, 5-Much Easier Than Expected

Once again, the students on clinical rotations may have been partially protected by increased resiliency with accumulated experience of high stress and work demands in medical school. Within *emotional health*, the only statistically significant difference between groups was the ability to take time for oneself, which may also be related to a fixed schedule and fewer exams in clinical years. *Physical health* factors displayed no statistically significant differences between classes. However, nearly 50% of respondents rated their sleep and exercise as suboptimal, and nearly 40% rated diet is suboptimal. These findings may be due to the rigorous academic demands taking up most of the students' time (12). Overall, classes that demonstrated higher scores on metrics of burnout tended also to demonstrate poorer scores pertaining to wellness metrics.

Finally, almost 50% of total respondents rated their experienced challenge of medical school at NEOMED as *much worse* or *somewhat worse* than expected. These results did not significantly vary by stage in medical school. This is an issue that may be due to perceived expectations of medical school, changes due to remote learning during the COVID-19 pandemic, and factors controlled by NEOMED (e.g., curricular structure).

How can NEOMED respond?

As previously stated, NEOMED has taken steps in student wellness. NEOMED opened the Center for Student Wellness and Counseling Services (CSWCS), which offers free care for students. The CSWCS began providing telehealth and evening appointments to expand accessibility to students. Many students praised the CSWCS. NEOMED students have access to the Sequoia Wellness Center on the NEOMED campus, which offers a full range of gym equipment and aerobics classes as part of enrollment. NEOMED students are permitted to take

“wellness” days. Despite these initiatives, with the high rates of burnout and suboptimal wellness coupled with the medical school experience being more challenging than expected, there is room for further improvement. NEOMED should continue considering student feedback for iterative curricular implementation and improvement. Implementing a new curriculum will present a challenge to any university. During the pre-clinical years, the Peer Instruction emphasis is a valuable learning system; however, based on student feedback, improvements can still be made to this curriculum (13). Student feedback from this study requested fewer hours of Peer Instruction and no quizzes on the day following an exam. Members of the M2 class requested limiting lectures to run up to the USMLE Step 1 board exam. Continuing to meet with students and understanding their perspectives on the curriculum can help create and adjust a curriculum conducive to learning and student wellness.

NEOMED may benefit from a large project dedicated to promoting the components of wellness, mental health, physical health, and emotional health. As a specific example to improve mental health, NEOMED can provide free access to meditation apps such as Headspace, which has been demonstrated to have reduced stress by 14% (14). A larger-scale initiative on physical health and spreading awareness on the importance of its subcomponents: sleep, diet, and exercise may also be beneficial as many students are suboptimal in these categories. Examples include: virtual Zumba or yoga classes, meditation classes, or dietitian/chef-led cooking classes. Finally, emphasis on the components of emotional health by continuing to improve communication and consideration of students' lives outside of school can also be of benefit. A promising new initiative, which began in 2020, is the Exceptional Student Experience, a comprehensive initiative designed by NEOMED faculty to deliver a student-centered medical

school curriculum with a focus on patient care with humanistic values, clinical competence, board exam performance, residency competitiveness, and readiness, and personal wellness.

How can students respond?

In addition to NEOMED responding to factors outside a student's control, there are also several actions that students may take to improve symptoms of burnout. As demonstrated by our results, groups with higher scores on metrics of burnout also tended to demonstrate lower scores pertaining to wellness metrics. Therefore, these students may benefit by prioritizing components of wellness. For example, a sleep of an optimal duration (7-9 hours) is associated with higher test scores (15). Therefore, students may benefit by prioritizing this subcomponent of physical health, which can help improve a major stressor, academic performance (15).

Additionally, it should be noted that there may be a reason to believe that experience at NEOMED may build resilience, demonstrated by improved metrics of burnout and some metrics of wellness in the later clinical years.

Lessons and limitations?

Our study has several limitations. The most significant potential factor is the low response rate. Our sample size of 166 out of 599 total students only captured 28% of the total student population. There may be a response bias based on the students who answered the survey. Responding students may be experiencing burnout and suboptimal wellness at more significantly different rates than nonparticipants of the survey. They may be seeking help to deal with these issues and view the survey as a platform for them to be heard. They were also given three weeks to respond, which may not have been a sufficient timeframe. Additionally, certain demographic factors including age and marital status were not collected to protect subject privacy. This limited our ability to determine how representative our respective samples were from each class. Finally, the timing of the survey in the middle of demanding preclinical semesters and the COVID-19 pandemic may have generated more unfavorable responses as it has shown to be a significant contributing factor to stress in the medical profession (11).

CONCLUSION

The medical school appears to be a stressful experience for NEOMED College of Medicine students, with peak burnout frequencies and suboptimal wellness ratings in the preclinical years. The effects of burnout can be detrimental to medical students, physicians, and to the entire healthcare system. Our findings demonstrated that the groups that scored higher frequencies of burnout also scored lower on wellness ratings, therefore, a systematic approach dedicated to promoting wellness at NEOMED may lead to lower frequencies of burnout.

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CONFLICTS OF INTEREST

All authors declare no conflicts of interest.

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