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Well-being at a Military Medical School and Implications for Military Retention

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ABSTRACT

Introduction:

Physical and psychological well-being play a critical role in the academic and professional development of medical students and can alter the trajectory of a student's quality of personal and professional life. Military medical students, given their dual role as officer and student, experience unique stressors and issues that may play a role in their future intentions to continue military service, as well as practice medicine. As such, this study explores well-being across the 4 years of medical school at Uniformed Services University (USU) and how well-being relates to a student's likelihood to continue serving in the military and practicing medicine.

Methods:

In September 2019, 678 USU medical students were invited to complete a survey consisting of three sections—the Medical Student Well-being Index (MSWBI), a single-item burnout measure, and six questions regarding their likelihood of staying in the military and medical practice. Survey responses were analyzed using descriptive statistics, analysis of variance (ANOVA), and contingency table analysis. Additionally, thematic analysis was conducted on open-ended responses included as part of the likelihood questions.

Results:

Our MSWBI and burnout scores suggest that the overall state of well-being among medical students at USU is comparable to other studies of the medical student population. ANOVA revealed class differences among the four cohorts, highlighted by improved well-being scores as students transitioned from clerkships to their fourth-year curriculum. Fewer clinical students (MS3s and MS4s), compared to pre-clerkship students, indicated a desire to stay in the military. In contrast, a higher percentage of clinical students seemed to “reconsider” their medical career choice compared to their pre-clerkship student counterparts. “Medicine-oriented” likelihood questions were associated with four unique MSWBI items, whereas “military-oriented” likelihood questions were associated with one unique MSWBI item.

Conclusion:

The present study found that the overall state of well-being in USU medical students is satisfactory, but opportunities for improvement exist. Medical student well-being seemed to have a stronger association with medicine-oriented likelihood items than with military-oriented likelihood items. To obtain and refine best practices for strengthening engagement and commitment, future research should examine if and how military and medical contexts converge and diverge throughout training. This may enhance the medical school and training experience and, ultimately, reinforce, or strengthen, the desire and commitment to practice and serve in military medicine.

INTRODUCTION

Physical and psychological well-being are believed to play a critical role in the academic success and professional development of medical students.¹ The effects of well-being can reverberate into the academic, professional, and institutional foundations of medical training and, as students progress through their training, one might hope a growing sense of engagement, confidence, and professional identity builds over time. However, this ideal trajectory of professional devel-

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opment can be negatively affected by burnout, which can jeopardize a student's quality of life and medical education.²⁻⁶ Although changes in well-being throughout both basic science and clinical experiences in medical school have been examined,^{3,7-9} well-being across the entire 4 years of a military medical school has not previously been reported.

In a military medical school, learners take on the dual role of medical student and military officer, which presents a range of responsibilities and commitments that may inform students' intentions to continue serving beyond their initial military service obligation. To date, no studies have explored the association between medical students' well-being and their intent to stay in the military beyond their service obligation. This relationship is important because military medicine operates in a unique organizational and operational context, and "losing" trained physicians can jeopardize the nation's ability to maintain a ready medical force and, consequently, can impair combat and mission readiness.

In this exploratory survey study, we used a cross-sectional design to assess student well-being and burnout across the 4 years of undergraduate medical education at the Uniformed Services University (USU). We also examined the relationship between students' self-reports of well-being and burnout and their intent to stay in the military. Our study was guided by the following three research questions:

1. What is the current state of well-being and burnout among medical students at USU?
2. How do well-being and burnout differ, if at all, across four medical school cohorts at different phases of the curriculum?
3. What is the relationship between medical student well-being and burnout and the likelihood of staying in or leaving military service, leaving medical practice, and attending medical school, if given the choice again?

METHODS

Survey Development

The survey instrument consisted of three sections—the Medical Student Well-being Index (MSWBI), burnout, and likelihood of staying in or leaving the military, leaving medicine, and attending medical school, if given the choice again (see [Appendix](#)). The MSWBI—a tool with validity evidence that was partially gathered at USU—includes seven items—six Yes/No questions and one open-ended comment.^{10,11} The first item asks participants if they felt burned out from medical school and all remaining Yes/No questions ask about the frequency at which participants experienced symptoms and behaviors of burnout during the past month. The open-ended comment item asks participants to report the strategies and techniques used to maintain personal well-being in medical school.

The burnout section of the survey is a single, non-proprietary item with prior validity evidence that is comparable to the Maslach Burnout Inventory for Physicians.¹² This item asked participants to rate their level of burnout based on their own definition of burnout, using a five-point scale ranging from "I enjoy my work. I have no symptoms of burnout" to "I feel completely burned out and often wonder if I can go on. I am at the point where I may need some changes and may need to seek some sort of help."

The "likelihood" section had four Likert-type items and two open-ended items. The Likert-type items pertained to the likelihood of staying in or leaving military service, leaving medical practice, and whether respondents would attend medical school again (if given the opportunity to revisit their career choices). Survey participants were asked to elaborate on their choices on two Likert-type items—leaving military service following completion of service obligation and attending medical school again.

For the MSWBI and burnout measures, final variable scores were created by computing a mean score for the associated item(s). Higher average scores reflected lower well-being, whereas lower scores indicated higher well-being. The survey was piloted with several medical students who thought aloud as they completed the survey to ensure the questions elicited an appropriate response process.

The present observational longitudinal study was approved by USU's Institutional Review Board (IRB MED-83-9823).

Survey Administration, Participants, and Setting

The first invitation to complete the survey was sent to all USU medical students ($N = 678$, Class 2020 to Class 2023) in September 2019. Following the initial invitation, three reminders were sent at 2-week intervals. Given the sensitive nature of some survey items, students were provided with institutional resources and services and encouraged to seek support, if necessary. Participation in the survey was voluntary and was explicitly noted in the survey's informed consent form.

The School of Medicine at USU is the Nation's only federal school of medicine and is committed to excellence in military medicine and public health during periods of peace and war. Each medical student is commissioned as a military or Public Health Service officer, and every graduate goes on to serve in the Military Health Service or Public Health Service. USU medical students participate in a 4-year curriculum divided into three phases: pre-clerkships (~1.5 years), core clerkships (1 year), and post-clerkships (~1.5 years). During the pre-clerkships, students establish their scientific foundation and start developing professional identities as officers and physicians. In the core clerkships, students are introduced to the roles and responsibilities associated with the inpatient and outpatient clinical environments. During post-clerkships, students build upon their clinical decision-making skills in advanced clerkships, participate in the culminating military

field practicum, Operation Bushmaster (an applied military medical practicum), and apply for residency programs. During survey administration, the Class of 2020 was in the midst of their post-clerkship phase, the Class of 2021 was in the completing their core clerkships, the Class of 2022 was finishing their pre-clerkship training, and the Class of 2023 was beginning medical school.

Analyses

To rule out non-response bias, we conducted a wave analysis to examine whether there were notable differences in well-being/burnout markers among the students who responded to the initial invitation to participate and those who responded subsequently to each of the three reminders. In wave analysis, late respondents are considered proxies for non-responders, and their responses are compared with responses from the first wave.

Likelihood measures were analyzed using descriptive statistics, average MSWBI and burnout scores across four student cohorts were analyzed using analysis of variance (ANOVA), and average and individual MSWBI and likelihood measures were analyzed using contingency tables.¹¹ All were calculated using SPSS.¹³ Open-ended comments were thematically analyzed by three members of the study team (M.S., T.D., and J.B.) using a codebook developed by all three coders. Any differences were reconciled as a group until consensus among all three coders was reached.

RESULTS

Overall, 336 students out of 678 (49.5%) consented to participate and opened the survey. There were no statistically significant differences between the first wave and the last (the fourth) wave of respondents on either the burnout item ($t(187) = 0.38, P = .71$) or the total number of endorsements (i.e., marking “yes” and confirming the occurrence of specific behavior, attitude, or issue) on the MSWBI ($t(188) = 0.47, P = .64$). Average scores for medical student well-being and

burnout and the extent to which these measures differed across the four classes are presented in [Table I](#).

Results from the MSWBI revealed that the mean number of endorsements from our respondents was 1.29 (SD 0.26). ANOVA revealed class differences among the four cohorts. Specifically, the average number of endorsements in the MS3's was statistically significantly higher than that of the First-year medical students (MS1s) and Second-year medical students (MS2s). No statistically significant difference emerged between Third-year medical students (MS3s) and Fourth-year medical students (Ms4s). The average burnout score for the four medical school cohorts was 2.24. Although 210 students (69.8%) indicated no symptoms of burnout or did not feel burned out, 78 (25.9%) reported one or more symptoms of burnout, 12 (4.0%) experienced symptoms of burnout that did not go away, and 1 (0.3%) felt completely burned out and needed to seek some sort of help. ANOVA also revealed group differences between the four cohorts. In particular, a burnout score of 1.93 among MS1s was significantly lower than all three of the upper cohorts.

[Table II](#) lists students' responses regarding their likelihood of staying in or leaving the military, leaving medicine, and attending medical school again. Fewer clinical students (MS3s and MS4s), compared to pre-clerkship students, indicated a desire to stay in the military. This difference was corroborated by responses to the “leave military service” measure, where more pre-clerkship students indicated they would not leave the military after their current service obligation was completed, compared to their clinical student counterparts. Overall, a majority (81.0%) of students across all four cohorts reported that they were “not at all likely” to leave medical practice after their service obligation. Although almost 50% of students indicated they would “definitely” attend medical school again (if given the opportunity to revisit their career choices), a higher percentage of upper-class students seemed to *reconsider* (definitely not, probably not, not sure) their medical career choice (35.9%) compared to their pre-clerkship student counterparts (9.4%). In fact, nearly 20%

TABLE I. Comparison of Medical Student Well-being and Burnout by Class

	Class	Mean (SD)	F statistic	Significant post-hoc comparison (LSD) ^c
Medical student well-being ^a	MS4	1.32 (0.28)	$F(3, 290) = 3.23 (P < .05)$	MS2, MS1 MS3 MS3
	MS3	1.35 (0.27)		
	MS2	1.24 (0.22)		
	MS1	1.24 (0.27)		
	Overall	1.29 (0.26)		
Burnout ^b	MS4	2.36 (0.63)	$F(3, 288) = 11.42 (P < .001)$	MS1 MS2, MS1 MS3, MS1 MS4, MS3, MS2
	MS3	2.55 (0.78)		
	MS2	2.15 (0.67)		
	MS1	1.93 (0.55)		
	Overall	2.24 (0.70)		

^aFor medical student well-being, 1 = No, 2 = Yes.

^bFor burnout, 1 = I enjoy my work. I have no symptoms of burnout, 5 = I feel completely burned out and often wonder if I can go on. I am at the point where I may need some changes and may need to seek some sort of help.

^cLeast significant difference (LSD) post hoc comparison.

TABLE II. Descriptive Statistics of the “Likelihood” Section ($N = 324$)

	Class	Not at all likely	Somewhat likely	Moderately likely	Quite likely	Definitely
Stay in the military	MS4	4 (5.1)	15 (19.2)	17 (21.8)	26 (33.3)	16 (20.5)
	MS3	2 (2.6)	18 (23.1)	18 (23.1)	23 (29.5)	17 (21.8)
	MS2	0	8 (9.1)	13 (14.8)	42 (47.7)	25 (28.4)
	MS1	3 (4.2)	4 (5.6)	10 (14.1)	37 (52.1)	17 (23.9)
	Overall	9 (2.8)	45 (13.9)	61 (18.8)	132 (40.7)	77 (23.8)
Leave military	MS4	12 (15.4)	37 (47.4)	15 (19.2)	11 (14.1)	3 (3.8)
	MS3	24 (30.8)	23 (29.5)	20 (25.6)	9 (11.5)	2 (2.6)
	MS2	36 (40.9)	32 (36.4)	17 (19.3)	2 (2.3)	1 (1.1)
	MS1	33 (46.5)	29 (40.8)	5 (7.0)	2 (2.8)	2 (2.8)
	Overall	109 (15.8)	126 (18.3)	57 (8.3)	24 (3.5)	8 (1.2)
Leave medical practice	MS4	52 (66.7)	18 (23.1)	7 (9.0)	1 (1.3)	0
	MS3	63 (80.8)	10 (12.8)	3 (3.8)	2 (2.6)	0
	MS2	74 (84.1)	10 (11.4)	3 (3.4)	1 (1.1)	0
	MS1	66 (93.0)	4 (5.6)	1 (1.4)	0	0
	Overall	255 (81.0)	42 (13.3)	14 (4.4)	4 (1.3)	0
Attend medical school again		Definitely not	Probably not	Not sure	Probably yes	Definitely yes
	MS4	4 (5.1)	10 (12.8)	17 (21.8)	26 (33.3)	21 (26.9)
	MS3	0	8 (10.3)	17 (21.8)	26 (33.3)	27 (34.6)
	MS2	0	3 (3.4)	6 (6.8)	28 (31.8)	51 (58.0)
	MS1	0	1 (1.4)	5 (7.0)	21 (29.6)	44 (62.0)
	Overall	4 (1.3)	22 (7.0)	45 (14.3)	101 (32.1)	143 (45.4)

Stay in the military: What is the likelihood that you will stay in the military for a full career (20 or more years)?

Leave military: What is the likelihood that you will leave military service following the completion of your current service obligation?

Leave medical practice: What is the likelihood that you will leave medical practice following the completion of your current service obligation?

Attend medical school again: If you could revisit your career choices, would you choose to attend medical school again?

of MS4 respondents reported they would “definitely not” or “probably not” attend medical school again.

We found no association between the six MSWBI items and the likelihood of leaving the military beyond the service obligation. Only one well-being item (“Do you feel burned out from medical school?”) had a significant association with the likelihood of staying in the military for a full career ($X^2(4) = 15.46$, $P < .1$). Likelihood of leaving medical practice following the completion of one’s current service obligation had a statistically significant relationship with two well-being items—“Do you feel burned out from medical school?” ($X^2(3) = 14.01$, $P < .01$); and “During the past month, have you often been bothered by feeling down, depressed, or hopeless?” ($X^2(3) = 13.08$, $P < .01$).

The medical student well-being scale, however, was more strongly associated with the students’ likelihood to choose to attend medical school again. Student endorsements on four out of the six items had a statistically significant relationship with this intention (all P -values $< .01$). Table III presents details on an example of one of these relationships. In this table, if the absolute value of the adjusted residual is larger than 1.96, it indicates a statistically significant relationship between the particular pair of values on the survey items. The values from these four items (“During the past month, have you been bothered by emotion problems?”; “During the past month, have you felt that all things you had to do were piling up so high that you could not overcome them?”; “During the past month, have you often been bothered by feeling down, depressed, or hopeless?”; “Do you feel burned out from

medical school?”), when associated with the likelihood item, consistently reported absolute adjusted residuals larger than 1.96.

To explore what factors—beyond well-being—might contribute to consideration to leave the military and attend medical school again, a thematic analysis of the open-ended comments was conducted. Three salient themes emerged. When considering whether to leave the military after completion of one’s service obligation, students reported that their remaining service obligation, preferred work culture and personal lifestyle, and service to the military would dictate whether they would stay or leave the military. When reflecting on their medical school experience and whether they would “do it all over again,” 50% of student responses indicated that intrinsic motivation (i.e., driven by purpose, service, and/or aspiration) would lead them to choose medical school again, if they had the chance to reconsider their decision. Students clearly indicated that the negative impact on their well-being and the expectations and realities of medical training and the profession would dissuade them from attending medical school again.

DISCUSSION

Our MSWBI score suggests that the overall state of well-being among medical students at USU is comparable to other studies of the medical student population. Specifically, a comparison of our MSWBI scores with a similar study of medical students from seven medical schools across the country revealed that USU students reported slightly lower MSWBI scores

TABLE III. Association Between Likelihood of Attending Medical School Again and Feeling Burned Out From Medical School

Likelihood of attending medical school again	Do you feel burned out from medical school?		
		No	Yes
Definitely not	Observed count	1	3
	Expected count	2.5	1.5
	Adjusted residual	-1.5	1.5
	% within the likelihood item choice	25%	75%
	% within the well-being item choice	0.5%	2.6%
Probably not	Observed count	4	17
	Expected count	12.9	8.1
	Adjusted residual	-4.1*	4.1*
	% within the likelihood item choice	19%	81%
	% within the well-being item choice	2.2%	14.5%
Not sure	Observed count	14	25
	Expected count	23.9	15.1
	Adjusted residual	-3.5*	3.5*
	% within the likelihood item choice	35.9%	64.1%
	% within the well-being item choice	7.5%	21.4%
Probably Yes	Observed count	54	45
	Expected count	60.8	38.2
	Adjusted residual	-1.7	1.7
	% within the likelihood item choice	54.5%	45.5%
	% within the well-being item choice	29%	38.5%
Definitely Yes	Observed count	113	27
	Expected count	85.9	54.1
	Adjusted residual	6.4*	-6.4*
	% within the likelihood item choice	80.7%	19.3%
	% within the well-being item choice	60.8%	23.1%

* $P < .05$.

(USU mean = 1.26, SD = 0.26; 2011 study mean = 1.33, SD = 0.19).¹⁰ Because the single-item burnout measure has not been used on a similar population, we are unable to provide an appropriate reference point for that measure. Although students are experiencing stress and various symptoms related to burnout, they do not seem to be reporting that they are “feeling” burned out. Disaggregating these overall numbers by class cohorts, there appear to be potential stress points across the medical school curriculum. Across both well-being measures, average scores trended worse (i.e., slightly more burned out) among MS3 responses or students in their clerkship year. This finding supports reports in the literature that clerkships—typically experienced during the third year of medical school—expose students to unique stressors that can impair their well-being (e.g., clinical hours, demands of clinical medicine, systematic health care issues, etc.).^{5,14,15}

Interestingly, although average well-being scores for third-year students were significantly different from first- and second-year students, they did not differ significantly from fourth-year students. In fact, average well-being scores began to improve slightly for fourth-year medical students. This trend also occurred in the burnout measure. This trend may either highlight the role of context and environment in well-being, i.e., transitioning away from the wards, or the maturation and development of their professional identities, especially with regard to serving as both an officer and a student.

In our examination of “likelihood” measures and well-being, the analysis revealed a notable trend: Medical student well-being seemed to have a stronger association with “medicine-oriented” likelihood items than with “military-oriented” likelihood items. “Medicine-oriented” measures were associated with four unique MSWBI items, whereas “military-oriented” items were associated with one unique MSWBI item. That is, medical student well-being may be playing a larger role in likelihood of choosing to attend medical school again and intention to continue practicing medicine than in intention of staying in or leaving the military. It is important to note here that we are interpreting one’s likelihood to attend medical school again (if given the opportunity to revisit their career choices) as either a reflection of their satisfaction with medical training or their desire to continue in the profession.

These associations are important to consider given the dual roles that USU students serve. Of the medical and military contexts, the medicine-specific context could be playing a more robust role in how and why medical student well-being shifts during medical school. Results from the thematic analysis suggest that the most salient reason why a student would not consider attending medical school again was “the expectations and realities of medical training and the profession.” Future work should consider what, if any, medicine-specific factors contribute to burnout, or decreased well-being, and how institutions can improve medical training.

This study has several limitations. First, we unintentionally excluded one item from the MSWBI (“Do you worry that medical school is hardening you emotionally?”). Although this excluded item did not impact the contingency table analysis, it may have limited our capacity to better understand well-being in our population. Second, this study relies on a snapshot of survey data and may not accurately represent the longitudinal experience of each cohort of medical school. Because we did not employ a longitudinal design, care must be taken not to over-interpret our findings, particularly with respect to the differences observed across the 4 years of medical school. Third, nearly half of the medical school population did not respond to the survey and the findings may be impacted by non-response bias (although the wave analysis suggests that non-response bias may not be a significant problem in the present study). Fourth, validity

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CONFLICT OF INTEREST STATEMENT

None declared.

evidence for the single-item burnout measure has not been collected with a medical school student population. Thus, additional evidence of validity may need to be gathered to further the effective use of said measure for this population. And finally, survey data collection took place before the COVID-19 pandemic. As is documented in the literature,^{16,17} the pandemic created new, pervasive stressors that have not been traditionally experienced by medical students. Issues such as, but not limited to, transitioning to a fully remote learning environment, delay or replacement of pivotal clinical experiences, or logistical changes in board examinations likely may have had an impact on the well-being of medical students.

Despite these limitations, the present findings shed light on several stress points in the curriculum, as well as stress points in the comprehensive medical school experience overall. If well-being worsens through the third year of medical school and into the fourth, then military medical school faculty and administrators may want to consider providing additional advising, mentoring, coaching, student support programming, or individualized behavioral health support for students struggling with burnout during clerkships. Additionally, if we are aware of the challenges of the third and fourth years of medical school and the subsequent drop in well-being, then institutions may want to bolster the pre-clinical curriculum with mindfulness trainings or other relevant interventions that students can use to cope with negative stressors.^{18,19}

To obtain and refine best practices for strengthening engagement and commitment, future research should investigate what specific aspects of “military” training in the medical context might strengthen students’ commitment to medical practice beyond their required service obligations. Researchers also should examine what specific aspects of “medical” training in the military context might dissuade one from revisiting medical career choices. Additionally, future research should examine if and how these two contexts—medical and military—converge and diverge throughout training. Given the shift in teaching and learning because of the ongoing pandemic, a follow-up study may be warranted to reassess whether well-being has changed for military medical students because of COVID-19.

The present study found that the overall state of well-being in USU medical students is satisfactory, but opportunities for improvement exist. Capitalizing on these opportunities may enhance the medical school and training experience and, ultimately, reinforce, or strengthen, the desire and commitment to practice and serve in military medicine. Attention to enhancing well-being and preventing burnout is likely to help preserve, and even increase, retention and, consequently, combat and mission readiness. Further examination of how to maintain and strengthen well-being, especially during the third and fourth years of medical school, is warranted.

SINGLE-ITEM BURNOUT ITEM

1. Overall, based on your definition of burnout, how would you rate your level of burnout?
 - I enjoy my work. I have no symptoms of burnout.
 - Occasionally I am under stress, and I don’t always have as much energy as I once did, but I don’t feel burned out.
 - I am definitely burning out and have one or more symptoms of burnout, such as physical and emotional exhaustion.
 - The symptoms of burnout that I’m experiencing won’t go away. I think about frustration at work a lot.
 - I feel completely burned out and often wonder if I can go on. I am at the point where I may need some changes and may need to seek some sort of help.

QUESTIONNAIRE REGARDING MEDICAL PRACTICE, MILITARY SERVICE, ATTENDING MEDICAL SCHOOL AGAIN

Page Instructions: Please indicate how you *currently* feel about your career plans.

9. What is the likelihood that you will stay in the military for a full career (20 or more years)?
 - Not at all likely
 - Somewhat likely
 - Moderately likely
 - Quite likely
 - Definitely
10. What is the likelihood that you will leave military service following the completion of your current service obligation?
 - Not at all likely
 - Somewhat likely
 - Moderately likely
 - Quite likely
 - Definitely

11. What is the likelihood that you will leave medical practice following the completion of your current service obligation?
- Not at all likely
 - Somewhat likely
 - Moderately likely
 - Quite likely
 - Definitely
12. If you could revisit your career choices, would you choose to attend medical school again?
- Definitely Not
 - Probably Not
 - Not sure
 - Probably Yes
 - Definitely Yes
13. You noted on the previous question that you are “{{ Q10 }}” to leave military service following the completion of your current service obligation. In the area below, please explain why you answered “{{ Q10 }}” to this question.
-
14. You answered “{{ Q12 }}” to the previous question about whether you would choose to attend medical school again were you given the chance to revisit your career choices. In the area below, please explain why you answered “{{ Q13 }}” to this question.
-

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