

How Medical Student Manage Depression, Anxiety, and Stress: A Cross-Sectional Study

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Table of Contents

Original Manuscript.....	4
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Abstract

This study examines the stress management behaviors of first-year (M1) and second-year (M2) students at an allopathic medical school in California and investigates which activities they employ to manage the feelings associated with this stressful period in their academic careers. A total of 120 M1 and 126 M2 students were contacted via email for this study, and 27 responses were collected. Results indicate that M2 students experience higher levels of stress, anxiety, and depression, potentially due to isolation and USMLE Step 1 preparation. Female participants were more likely to read to relax ($H(1) = 4.994, p = .025$), while M1s preferred socializing ($H(1) = 5.081, p = .024$) and M2s engaged in painting ($H(1) = 4.000, p = .046$). This study can thus better inform medical schools about creating multifaceted support systems for their students, which may improve their well-being and better prepare them for the demanding field of medicine.?

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Original Manuscript

How Medical Student Manage Depression, Anxiety, and Stress: A Cross-Sectional Study

Authors: Jonathan Shaw^{1*}, Ashley Lai^{1*}, Sasha Singh¹, Seung Rim Yoo¹, Maha Fathali¹, Laura Stuck¹, James Hagerty¹, Van Le¹, Jisu Shin¹, Charles Lai¹, Peter Bota¹, Aaron Jacobs¹

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Introduction

Due to the intense pressure and stress of the training process, medical students face a higher risk of burnout and depression when compared to the general U.S. population [1]. Medical students must prioritize their time to pursue extracurriculars, such as research, to ensure a successful residency application during their fourth year, especially for highly competitive specialties. Academic stress, peer-to-peer relationships, and finances are just some stressors students can face in medical school [2]. Stress can have prominent consequences, impacting sleep quality, physical and mental health, and academic performance [3]. Stress has led to students reporting feelings of burnout, with some even considering leaving medicine [4]. Medical students have a variety of coping mechanisms to manage stress, with beneficial activities such as exercise or unhealthy behaviors such as alcohol abuse [5,6].

This study aims to examine the stress management behaviors of M1 and M2 medical students at an allopathic medical school and investigate if and how such activities help mitigate feelings of stress to improve further efforts in promoting medical student wellness.

Methods

1. Participants and Recruitment

A total of 120 M1 and 126 M2 students at a California allopathic medical school were contacted via institutional email to an anonymous survey. One survey round was sent out, and 27 responses were collected.

2. Measures

The survey of this study was composed of 2 demographic questions (school year, gender), 24 multiple choice questions on stress management, 1 free response question that allowed participants to list any stress management activities not previously listed and their frequency [Table1], and 21 randomly shuffled questions from the Depression, Anxiety and Stress Scale (DASS-21) [7].

3. Statistical Analysis

Data was analyzed using IBM SPSS Statistics 28.0.1.0. Normality was tested via Kolmogorov-Smirnov. For subsets of the data identified as non-normally distributed, a Kruskal Wallis (via K Independent Samples) test with "Gender" and "School Year" as the grouping variables and the range being defined as minimum = 1 and maximum = 2 was conducted. Additionally, Spearman's correlations were obtained through the bivariate correlation function of SPSS.

Results

The Kolmogorov-Smirnov test found that neither the questions nor the DASS-21 subscores were normally distributed. Spearman's correlations showed that school year positively correlated moderately with stress ($r(27) = .699$, $p < .001$), moderately with anxiety ($r(27) = .585$, $p < .001$), and moderately with depression ($r(27) = .408$, $p = .034$).

Table 1: Kruskal Wallis Results

Question/Topic	Descriptives	
	Kruskal Wallis P-value	Group 1 Group 2
Read books to relax	H(1) = 4.994 .025	M = .67, SD = .900 ^a M = .00, SD = .000 ^b
Talk with friends	H(1) = 5.888 .015	M = 2.28, SD = .895 ^a M = 1.44, SD = .726 ^b
Go out with friends in-person	H(1) = 5.081 .024	M = 1.14, SD = .910 ^c M = .20, SD = .447 ^d
Painting	H(1) = 4.000 .046	M = .00, SD = .000 ^c M = .75, SD = 1.500 ^d
Find it harder to wind down	H(1) = 12.222 .001	M = .62, SD = .590 ^c M = 2.50, SD = .837 ^d

Aware of having a dry mouth	H(1) = 10.300	.001	M = .10, SD = .301 ^c	M = 1.50, SD = 1.225 ^d
Couldn't experience positive feelings	H(1) = 7.502	.006	M = .14, SD = .359 ^c	M = 1.33, SD = 1.366 ^d
Difficulty breathing	H(1) = 5.234	.022	M = .10, SD = .301 ^c	M = .67, SD = .816 ^d
Overreacting to situations	H(1) = 6.131	.013	M = .19, SD = .402 ^c	M = 1.17, SD = 1.169 ^d
Using a lot of nervous energy	H(1) = 13.211	.001	M = .57, SD = .676 ^c	M = 2.33, SD = .516 ^d
Getting more agitated	H(1) = 6.911	.009	M = .57, SD = .870 ^c	M = 2.00, SD = 1.095 ^d
Difficult to relax	H(1) = 9.453	.002	M = .81, SD = .873 ^c	M = 2.50, SD = .837 ^d
Felt down-hearted and blue	H(1) = 4.374	.036	M = .48, SD = .602 ^c	M = 1.33, SD = 1.033 ^d
Felt close to panic	H(1) = 8.576	.003	M = .14, SD = .478 ^c	M = 1.17, SD = 1.169 ^d
Unable to become enthusiastic	H(1) = 3.837	.050	M = .33, SD = .658 ^c	M = 1.00, SD = .894 ^d
Feeling scared without any good reason	H(1) = 5.565	.018	M = .24, SD = .539 ^c	M = 1.17, SD = 1.169 ^d
Stress levels (DASS-21)	H(1) = 12.715	.001	M = 5.48, SD = 4.665 ^c	M = 20.50, SD = 4.416 ^d
Anxiety levels (DASS-21)	H(1) = 8.894	.003	M = 2.43, SD = 3.091 ^c	M = 11.17, SD = 7.139 ^d
Depression levels (DASS-21)	H(1) = 4.336	.037	M = 4.67, SD = 5.677 ^c	M = 13.67, SD = 11.535 ^d

^a denotes female group, ^b denotes male group, ^c denotes M1 group, ^d denotes M2 group

Discussion

Female participants were more likely to read ($H(1) = 4.994$, $p = .025$) and talk with friends ($H(1) = 5.888$, $p = .015$). This may stem from gendered socialization, where girls are encouraged to read, or due to this study's relatively small sample size [8]. Additionally, although men and women receive similar social support, women tend to receive more emotional support, likely due to societal norms that discourage male emotional expression while encouraging it in women. Exercise habits did not significantly differ by school year or gender. Prior studies have shown that exercise reduces burnout and improves quality of life [6], suggesting medical schools should encourage physical activity, especially for students studying remotely.

Regarding school year differences, M1s were more likely to go out with friends ($H(1) = 5.081$, $p = .024$). M2s' varied schedules, due to rotations or professional development (PD) semesters, which at this institution are a dedicated six-month period to complete self-directed activities such as research projects or studying for the United States Medical Licensing Examination (USMLE) Step exams. This may limit socialization opportunities compared to M1s, who remain on a shared schedule. M2s reported higher levels of stress, anxiety, and depression than M1s, potentially due to clinical rotations, PD semesters, or Step 1 exam preparation. The 6-8 week 'dedicated' study period is highly stressful, and despite Step 1's transition to pass/fail, concerns remain about its impact on mental health.

These findings highlight the need for increased social activities, with events such as mug painting, potlucks, or board game nights, to support medical students. Future research should focus on

optimizing such interventions not only for M2s but also for M3s and M4s, who were not included in this study. Future studies should also measure stress management and stress levels longitudinally across cohorts of various institutions so that standardized approaches can be developed, which can further be adjusted to fit the cultures of individual institutions.



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Conflict of Interest: The researchers of this study declare no conflicts of interest.

Ethics statement: This study received ethical approval from the CUSM IRB (approval: HS-2023-56) on November 27, 2023. This study was performed in accordance with the ethical standards as laid down in the 1964 Declaration of Helsinki and its later amendments. Informed consent was obtained from all individual participants included in the study.

Data Accessibility Statement: The data used to support our conclusions was not acquired from a public repository. The raw data and statistical analyses can be accessed through the following link: <https://doi.org/10.3886/E221562V1>. This work is licensed under a Creative Commons Attribution 4.0 International (CC BY 4.0) License.

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