Analysis IN BRIEF

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Personal Well-being Among Medical Students: Findings from a Pilot Survey

Supplemental Information

References

1. Dyrbye LN, Shanafelt TD. Medical student distress: A call to action. *Acad Med.* 2012;86:801-803.

2. Dyrbye LN, Thomas MR, Shanafelt TD. Medical student distress: Causes, consequences, and proposed solutions. *Mayo Clinic Proceedings.* 2005;80:1613-1632.

3. Dyrbye LN, Thomas MR, Eacher A, et al. Race, ethnicity, and medical student well-being in the United States. *Arch of Int Med.* 2007;167:2103-2109.

4. Dyrbye LN, Harper W, Moutier C, Durning SJ, Power DV, Massie Jr S, et al. A multi-institutional study exploring the impact of positive mental health on medical students' professionalism in an era of high burnout. *Acad Med.* 2012;87:1024-1031.

5. Beagan BL. Everyday classism in medical school: Experiencing marginality and resistance. *Med Ed.* 2005;39:777-784

Additional Methodological Information

Survey participation

The response rate for the 2013 Medical Student Life Survey (MSLS) was 18 percent (3,466/19,555). Specifically, 4,863 individuals opened the survey, which included 4,082 individuals who responded to the survey and 781 "non-respondents." Non-respondents included 194 individuals who selected "No" to the first question of the survey, "Are you a second-year medical student at a U.S. medical school?"; 467 individuals who responded "Yes" to the first question but did not respond to any other question; and 120 individuals who opened the survey but did not respond to any question.

Following the American Association of Public Opinion Research (AAPOR) guidelines for defining a survey sample, the 4,082 individuals were categorized into three groups of respondents: break-offs, partial surveys, and complete surveys. Break-offs include those individuals who responded to less than 50 percent of the questions. Partial surveys include those individuals who responded to at least 50 percent of the questions. Complete surveys include those individuals who responded to at least 80 percent of the questions and at least one of the four "crucial" questions (first generation college status, sexual orientation, gender identity, and race/ethnicity).

Of the 4,082 respondents, 616 were break-offs, 161 were partial surveys, and 3,305 were complete surveys. After removing all break-offs, the final MSLS sample is 3,466. Respondents (complete surveys) took an average of 16 minutes to complete the MSLS.

Supplemental Table 1: Race and Ethnicity and Gender Composition for Population of Students versus the MSLS Respondents

	Population (2nd yr students)		MSLS Sample		
	N	%	N	%	Response rate
Race and Ethnicity					
Hispanic, Latino, or of Spanish origin	1,669	8.5	241	7.3	14.4
American Indian or Alaskan Native	127	0.6	25	0.8	19.7
Asian	3,881	19.8	389	11.8	10.0
Black or African-American	1,288	6.6	123	3.7	9.5
Native Hawaiian or Other Pacific Islander	16	0.1	3	0.1	18.8
White	11,214	57.3	2,257	68.3	20.1
Multiple	671	3.4	136	4.1	20.3
Other/Missing	689	3.5	131	4.0	19.0
TOTAL	**19,555**	**100.0**	**3,305**	**100.0**	**16.9**
Gender					
Female	9,192	47.0	1,725	52.2	18.8
Male	10,364	53.0	1,568	47.4	15.1
Other/Missing			12	0.4	
TOTAL	**19,555**	**100.0**	**3,305**	**100.0**	**16.9**

Correlation among scales

Correlations among the measures show a strong association between stress and quality of life (QOL) (r=-.708), and more moderate relationships between fatigue and stress (r=.466), fatigue and QOL (r=-.537), and social support and QOL (r=.444). All other pairwise associations were relatively weak. In particular, financial concerns appeared to be largely independent of perceived stress, QOL, social support, and fatigue. Taken together, these correlations show that these measures, with the possible exception of financial concerns, are reliable global indicators of student well-being.

Supplemental Table 2: Correlation Coefficients for Relationship Between Scales for Stress and Quality of Life (QOL)

	Stress (10=No stress)	**QOL** (10=As good as it can be)	**Fatigue** (10=No fatigue)	**Social support** (10=Highest level of support)
QOL (10=As good as it can be)	.708			
Fatigue (10=No fatigue)	.466	.537		
Social support (10=Highest level of support)	.371	.444	.265	
Financial concerns (10=No concerns)	.213	.199	.211	.192

Note: All scales range from 0 to 10. All coefficients are statistically significant at the .05 level.

Note on statistical significance and effect size for group differences

We identify differences in group means that are statistically significant at the .05 level, but also report "effect size" results (Cohen's *d*) in order to discern the extent to which the magnitude of the difference between two means is practically significant.

As noted in the *Analysis in Brief*, Table 1 shows that although most group differences across the well-being items are statistically significant, these differences are small. For instance, for item "financial concerns", the difference of 1.4 in group means between first generation college status respondents (3.8) and all other respondents (5.2) is statistically significant, but the effect size is considered small (Cohen's $d = .44$; i.e., the two groups differed by .44 standard deviation units, where a small effect size is generally greater than .2 but less than .5).

Table 1 (from AIB): Mean Values for Perceived Stress and Quality-of-life Measures, by Demographic Group (with full list of footnotes)

		N	%	Group's score on a scale of 0 to 10				
				Stress (10=No stress)	QOL (10="As good as it can be")	Fatigue (10="No fatigue")	Social support (10="Highest level of support")	Financial concerns (10="No concerns")
First generation college status[a]	Yes	485	14.7	5.4*[e]	5.9*[e]	4.0*	7.3*[e]	3.8*[e]
	No	2,809	85.0	5.8	6.3	4.4	7.9	5.2
Gender[b]	Female	1,725	52.2	5.6*[e]	6.2	4.1*	8.0*	4.9
	Male	1,568	47.4	6.0	6.3	4.6	7.6	5.0
Sexual orientation[c]	LGB	196	5.9	5.4*[e]	6.0	4.1	7.3*[e]	4.1*[e]
	Heterosexual	3,077	93.1	5.8	6.3	4.4	7.8	5.0
Race/ethnicity[d]	Asian	389	11.8	5.6*	6.2	4.3	7.6*	5.8*[f]
	URiM	389	11.8	5.4*[f]	6.0*	4.1*	7.7	4.6
	White	2,257	68.3	5.9	6.3	4.4	7.9	4.9
	Other	230	7.0	5.6*	6.1	4.4	7.6	5.1
ALL				**5.8**	**6.2**	**4.3**	**7.8**	**5.0**

* Indicates that the difference between group means is statistically significant ($P < .05$). For race/ethnicity, white is the reference group.

a. Eleven (.3%) respondents did not provide a response to the question.

b. Twelve (.4%) respondents did not provide a response to the question or respondent either Transgender male-to-female, Transgender female-to-male, Transgender do not identify as exclusively male or female, or Other (write-in).

c. Thirty-two (1.0%) respondents selected the Other (write-in) response option.

d. Forty (1.2%) respondents provided more than one race or ethnicity or selected Other.

e. This difference between two group means reveals a small effect size (Cohen's *d*).

f. This difference between the mean for URiM respondents and the mean for white respondents reveals a small effect size (Cohen's *d*).

Selected Survey Items from the 2013 Medical Student Life Survey (MSLS)

Quality of Life

The Medical Student Life Survey (MSLS) included the short version of the Perceived Stress Scale.[1] To measure quality of life (QOL), the MSLS included the Linear Analogue Self-Assessment (LASA) Scale.[2]

Perceived Stress Scale (PSS)

Q: The following questions ask you about your feelings and thoughts during the last month. In each case, indicate how often you felt or thought a certain way.

1. In the last month, how often have you felt that you were unable to control the important things in your life?
2. In the last month, how often have you felt confident about your ability to handle your personal problems?
3. In the last month, how often have you felt that things were going your way?
4. In the last month, how often have you felt difficulties were piling up so high that you could not overcome them?

Never
Almost never
Sometimes
Fairly often
Very often

Note: These four items are the shortened version of the original 10-item instrument.

Tests of reliability for PSS

The test of reliability showed that the four items below form a single scale (Cronbach's alpha = .847). It should be noted, however, that goodness-of-fit statistics from a confirmatory factor analysis (CFA) suggested caution (Root mean square error of approximation [RMSEA] = .112; Comparative fit index [CFI] = .985; Tucker-Lewis index [TLI] = .955). Modification indices show that specifying an additional path between either the positively-worded items or the negatively-worded items would improve the model fit. Including correlated measurement errors for the positively worded items dramatically improved the model (RMSEA = .017; CFI = .999; TLI = .999). The specification of these pairs suggested a "method effect" (i.e., positive/negative statement effect).

1 Cohen S, Kamarck T, Mermelstein R. A global measure of perceived stress. *Journal of Health and Social Behavior*. 1983;24:386-396.

2 Thomas MR, Dyrbye LN, Huntington JL, et al. How do distress and well-being relate to medical student empathy? A multicenter study. 2007. *General Internal Medicine.* 2007;22:177–183.

Linear Analogue Self-Assessment (LASA) Scale

Q: Please select the number best reflecting your response to the following that describe your feelings during the past week, including today. How would you describe:

1. Your overall quality of life?
2. Your overall mental (intellectual) well-being?
3. Your overall physical well-being?
4. Your overall emotional well-being?
5. Your level of social activity?
6. Your spiritual well-being?
   0 = As bad as it can be
   10 = As good as it can be
7. Your level of fatigue, on average?
   0 = Constant tiredness
   10 = No fatigue
8. Your level of social support from friends and family?
   0 = No support
   10 = Highest level of support
9. Your financial concerns?
   0 = Constant concerns
   10 = No concerns

Tests of reliability for LASA items

A single scale that included the first four "Your overall" items resulted in a very strong fit for the data (RMSEA = .046; CFI = .999; TLI = .996). These four items were used to summarize the overall QOL scale (alpha = .906).

Demographic questions

Questions on sexual orientation and gender identity were embedded in the demographic section of the MSLS. Each question comprised two components: a set of response options and a second question allowing for an optional write-in response. The questions followed the guidance from the 2009 Williams Institute report, *Best Practices for Asking Questions about Sexual Orientation.*[3]

Q: Are you a first-generation college student (i.e., your parents are not college graduates)?

Yes

No

Q: How do you self-identify? Please check all that apply:

Hispanic, Latino, or of Spanish origin
American Indian or Alaskan Native
Asian
Black or African-American
Native Hawaiian or Other Pacific Islander
White
Other____

3 The Williams Institute. *Best Practices for Asking Questions about Sexual Orientation on Surveys*. The Williams Institute, University of California, Los Angles, 2009.

Q: How do you self-identify?

Female
Male
Transgender male-to-female
Transgender female-to-male
Transgender do not identify as exclusively male or female
Other____

Q: If one of the above five identities did not best describe you, then with what identity do you feel more comfortable?

I self-identify as: _____

Q: How do you self-identify?

Heterosexual or straight
Gay or lesbian
Bisexual
Other____

Q: If one of the above three identities did not best describe you, then with what identity do you feel more comfortable?

I self-identify as: _____