Single Item Measures of Emotional Exhaustion and Depersonalization Are Useful for Assessing Burnout in Medical Professionals

Colin P. West, MD, PhD[1,2,5], Liselotte N. Dyrbye, MD[3], Jeff A. Sloan, PhD[2], and Tait D. Shanafelt, MD[4]

[1]Division of General Internal Medicine, Mayo Clinic, Rochester, MN, USA; [2]Division of Biomedical Statistics and Informatics, Mayo Clinic, Rochester, MN, USA; [3]Division of Primary Care Internal Medicine, Mayo Clinic, Rochester, MN, USA; [4]Division of Hematology, Mayo Clinic, Rochester, MN, USA; [5]Department of Medicine, Mayo Clinic, Rochester, MN, USA.

BACKGROUND: Burnout has negative effects on work performance and patient care. The current standard for burnout assessment is the Maslach Burnout Inventory (MBI), a well-validated instrument consisting of 22 items answered on a 7-point Likert scale. However, the length of the MBI can limit its utility in physician surveys.

OBJECTIVE: To evaluate the performance of two questions relative to the full MBI for measuring burnout.

DESIGN AND PARTICIPANTS: Cross-sectional data from 2,248 medical students, 333 internal medicine residents, 465 internal medicine faculty, and 7,905 practicing surgeons.

MEASUREMENTS AND MAIN RESULTS: The single questions with the highest factor loading on the emotional exhaustion (EE) ("I feel burned out from my work") and depersonalization (DP) ("I have become more callous toward people since I took this job") domains of burnout were evaluated in four large samples of medical students, internal medicine residents, internal medicine faculty, and practicing surgeons. Spearman correlations between the single EE question and the full EE domain score minus that question ranged from 0.76–0.83. Spearman correlations between the single DP question and the full DP domain score minus that question ranged from 0.61–0.72. Responses to the single item measures of emotional exhaustion and depersonalization stratified risk of high burnout in the relevant domain on the full MBI, with consistent patterns across the four sampled groups.

CONCLUSIONS: Single item measures of emotional exhaustion and depersonalization provide meaningful information on burnout in medical professionals.

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BACKGROUND

Burnout is a syndrome encompassing three domains (depersonalization, emotional exhaustion, and a sense of low personal accomplishment) that is associated with decreased work performance.[1] Burnout has been shown to be common in medical professionals at all stages of training and practice.[2–7] Furthermore, burnout has been associated with suboptimal patient care practices,[8] medical errors,[9] and reduced empathy.[10]

The most widely used, well-validated instrument for the assessment of burnout is the Maslach Burnout Inventory (MBI).[1] Using this 22-item tool, responders rate the frequency with which they experience various feelings or emotions on a 7-point Likert scale with response options ranging from "Never" to "Daily." Higher values of depersonalization (MBI-DP) and emotional exhaustion (MBI-EE) and lower values of personal accomplishment (MBI-PA) signify burnout. This instrument has been used in numerous previous studies of physicians,[2,11,12] and many evaluations of burnout have focused on the presence of high levels of either emotional exhaustion or depersonalization as a cornerstone of burnout among high-achieving medical professionals.[2,8,12]

Despite the recognized utility of the MBI for measuring burnout, the instrument's length limits its use for assessing burnout in larger surveys of medical professionals. Across numerous studies, one emotional exhaustion question ("I feel burned out from my work") and one depersonalization question ("I have become more callous toward people since I took this job") from the MBI have exhibited the highest factor loading with their respective burnout domains.[1,13–16] With this in mind, we assessed the performance of these two questions relative to the full MBI for measuring burnout in four groups of medical professionals: medical students, internal medicine residents, internal medicine faculty physicians, and practicing surgeons.

Table 1. Mean Overall MBI Score for Emotional Exhaustion (EE) by Response to "I Feel Burned Out From My Work"

	Medical students (n=2,136)	Internal medicine residents (n=330)	Internal medicine faculty (n=453)	Surgical faculty (n=7,740)	Pooled mean EE score* (n=10,659)
Never	8.4	9.9	8.6	7.1	7.4
A few times a year or less	13.6	13.6	14.6	14.1	14.0
Once a month or less	19.2	20.8	20.0	20.7	20.3
A few times a month	23.3	23.8	24.0	25.5	24.3
Once a week	28.6	30.2	30.6	30.9	30.2
A few times a week	34.1	36.5	35.4	36.6	35.9
Every day	40.3	42.0	41.1	42.3	41.6

Low burnout: 0–18; average burnout: 19–26; high burnout: 27–54

METHODS

Participants

Participants were from four separate studies of burnout in medical professionals. In 2007 all 4,287 medical students attending the Mayo Medical School, University of Washington School of Medicine, University of Chicago Pritzker School of Medicine, University of Minnesota Medical School, University of Alabama School of Medicine, University of California San Diego School of Medicine, and the Uniformed Services University of the Health Sciences were asked to complete a web-based survey on issues related to student well-being.[3] Responses from the 2,248 (52.4%) students providing data on this survey were included in the present analysis. All entering categorical and preliminary internal medicine trainees in academic years 2003 through 2008 at the Mayo Clinic Rochester Internal Medicine Residency program were invited to participate in the Mayo Internal Medicine Well-Being (IMWELL) Study, in which they were surveyed quarterly on issues relating to quality of life, well-being, and distress.[9] Initial survey responses for 333 of 432 (77.1%) residents were used for the current report.

In 2007, the Mayo Clinic Department of Medicine surveyed its physician faculty on issues relating to job satisfaction and well-being, including burnout, with 465 of 556 (83.6%) responding.[17] Finally, in 2008, the American College of Surgeons surveyed its physician membership on factors contributing to career satisfaction, with 7,905 of 24,922 (31.7%) responding.[18] The Mayo Clinic institutional review board approved each of these studies.

Statistical Analyses

Standard univariate statistics were used to characterize the sample. Spearman correlations between the single MBI-EE question and the MBI-EE score with that question excluded, and analogous results for the single MBI-DP question, were generated. For each response sample, mean MBI-EE and MBI-DP scores were compared across levels of the single MBI-EE and MBI-DP questions, respectively. Finally, to compare the single question results with those of the full MBI instrument, likelihood ratios and risks for high emotional exhaustion and high depersonalization were evaluated for each level of the single MBI-EE and MBI-DP questions. Statistical analyses were conducted using SAS version 9.1 (SAS Institute Inc., Cary, NC).

RESULTS

Ages of participants across the four samples differed as expected. The majority of medical students and internal medicine residents were 25–30 years of age, while the most common ages for the practicing internal medicine and surgical physicians were 45–54. Most responders (51.8% of medical students, 61.6% of internal medicine residents, 77.2% of internal medicine faculty, and 86.7% of surgeons) were men. No significant differences in results for men versus women were noted.

Spearman correlations between the single emotional exhaustion question and the MBI-EE score minus this question ranged from 0.76 to 0.83 across the four samples. Spearman correlations between the single depersonalization question and the MBI-DP score minus this question ranged from 0.61 to 0.72 across the four samples. When all items used to measure emotional exhaustion or depersonalization in the full MBI were evaluated, response to these two items showed the highest correlation with overall emotional exhaustion or depersonalization score in all four individual studies.

Mean overall MBI-EE and MBI-DP scores increased as the response to the single item questions increased in frequency,

Table 2. Mean Overall MBI Score for Depersonalization (DP) by Response to "I Have Become More Callous Toward People Since I Took this Job"

	Medical students (n=2,035)	Internal medicine residents (n=328)	Internal medicine faculty (n=457)	Surgical faculty (n=7,705)	Pooled mean DP score* (n=10,525)
Never	1.9	3.0	1.8	2.5	2.4
A few times a year or less	4.6	5.6	4.6	5.2	5.0
Once a month or less	7.1	8.3	7.8	8.4	8.0
A few times a month	9.7	12.1	8.9	10.9	10.6
Once a week	12.8	14.8	13.6	13.5	13.4
A few times a week	15.8	18.0	15.3	15.9	15.9
Every day	18.4	20.4	18.0	17.8	18.0

Low burnout: 0–5; average burnout: 6–9; high burnout: 10–30

Table 3. Likelihood Ratios and Pooled Risk for High Emotional Exhaustion (EE) by Response to "I Feel Burned Out from my Work"

	Medical students (n=2,136)	Internal medicine residents (n=330)	Internal medicine faculty (n=453)	Surgical faculty (n=7,740)	Pooled LR (n=10,659)	Pooled risk (n=10,659)
Never	0.00	0.05	0.00	0.01	0.01	0.4%
A few times a year or less	0.03	0.05	0.09	0.06	0.06	2.7%
Once a month or less	0.13	0.27	0.17	0.34	0.27	12.1%
A few times a month	0.52	0.59	1.28	1.49	1.13	36.3%
Once a week	2.83	5.70	9.61	8.41	6.15	75.6%
A few times a week	16.40	21.32	31.47	60.09	37.50	95.0%
Every day	79.63	26.93	30.30	36.02	41.74	95.5%

as shown in Tables 1 and 2. Mean overall scores for those answering "Never" or "A few times a year or less" to the single item measures were consistent with low average burnout in each domain. Mean overall scores for those answering "Once a week" or more often to the single item measures were associated with high average burnout in each domain. Mean overall scores for each response category on the single item measures were very similar across the four sample groups.

Likelihood ratios and risk for high emotional exhaustion and high depersonalization based on response to the single item measures are shown in Tables 3 and 4. Likelihood ratios and risk were again very similar across the four sample groups. The summary likelihood ratios for MBI-EE answers "Never" or "A few times a year or less" to the single item measure for emotional exhaustion were ≤0.06. In contrast, the likelihood ratios for MBI-EE answers "Once a week" or more often to the single item measure ranged from 6 to 42. Similarly, the summary likelihood ratios for MBI-DP answers "Never" or "A few times a year or less" to the single item measure for depersonalization were <0.18. The likelihood ratios for MBI-DP answers "Once a week" or more often to the single item measure ranged from 16 to 37. The pooled risk for high emotional exhaustion and high depersonalization increased with increased frequency of each single item measure (Online Figure).

DISCUSSION

This study confirms the ability of two single item measures of emotional exhaustion and depersonalization to provide important information on the likelihood of high burnout among physicians and medical students. Among those who answered a "few times a year" or less on the single item measures for emotional exhaustion or depersonalization, less than 7% had a high degree of burnout in that domain on the overall MBI. In contrast, among those who answered "a few times a week" or more on the single item measures, >90% had a high degree of burnout in each domain on the overall MBI. Supposing a baseline prevalence of high emotional exhaustion of 30% and the likelihood ratios found in this study, responding "A few times a year or less" to the question "I feel burned out from my work" indicates a probability of high emotional exhaustion on the full MBI of only 2.5%. Similarly, supposing a baseline prevalence of high depersonalization of 25% and the likelihood ratios found in this study, responding "A few times a week" to the question "I have become more callous toward people since I took this job" indicates a probability of high depersonalization on the full MBI of 92.5%.

Although these results show that response to single item measures of emotional exhaustion and depersonalization meaningfully stratify the risk of high burnout in the relevant domain, these two questions should not be viewed as replacements for the full MBI, which has a robust literature supporting its usefulness, validity, and reliability in assessing burnout in medical professionals. Burnout is a multifaceted construct, and no single item can fully reflect each domain of burnout. Therefore, these items are not meant to provide comprehensive assessment or monitoring of burnout for individual respondents. However, our study indicates that results on these two questions can serve as useful surrogates for the MBI in settings where it is not possible to administer the full 22-item instrument. For example, these two questions may be easily integrated into large surveys of medical workers that can only devote one or two items to a given topic. Thus, workplace "snapshots" of burnout may be obtained with administration of the full MBI where additional clarity is required.

This study's main strength is its large sample size, inclusion of participants from a variety of practice settings including national samples of physicians and medical students, and the striking consistency of the results across samples. Our aggregate sample of 10,525 physicians and medical students compares favorably with the original MBI validation sample of 1,104 physicians and nurses. However, this study does have limitations. First, response rates in the individual samples

Table 4. Likelihood Ratios and Pooled Risk for High Depersonalization (DP) by Response to "I Have Become More Callous Toward People Since I Took this Job"

	Medical students (n=2,035)	Internal medicine residents (n=328)	Internal medicine faculty (n=457)	Surgical faculty (n=7,705)	Pooled LR (n=10,525)	Pooled risk (n=10,525)
Never	0.02	0.09	0.02	0.05	0.05	1.7%
A few times a year or less	0.12	0.25	0.44	0.19	0.18	6.3%
Once a month or less	0.49	0.91	2.39	1.47	1.18	30.4%
A few times a month	2.36	5.46	3.82	4.66	3.96	59.5%
Once a week	10.27	13.35	20.56	18.82	15.97	85.5%
A few times a week	51.98	26.34	51.93	34.40	37.20	93.2%
Every day	64.93	∞	∞	21.66	26.58	90.8%

ranged from 32–84% and nonresponse bias could occur. Second, it is possible that the results do not generalize to medical workers other than physicians, although the consistency of our findings across the studied groups may argue against this. Third, although the medical student and surgeon cohorts in this study were derived from national multi-center studies, the internal medicine resident and faculty cohorts were from a single academic institution. Finally, it is important to emphasize the present analysis is not intended to develop a new instrument for the assessment of burnout, but rather to evaluate how the characteristics of two questions from the MBI correlate with the full overall MBI domain score.

In summary, response to the single question "I feel burned out from my work" on the 7-point Likert scale developed by Maslach provides meaningful stratification of risk of high burnout in the domain of emotional exhaustion. Similarly, response to the single question "I have become more callous toward people since I took this job" on the 7-point Likert scale developed by Maslach provides meaningful stratification of risk of high burnout in the domain of depersonalization. These two questions may be useful in assessing burnout in medical professionals in settings where the full MBI cannot be practically applied.

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Conflict of Interest: *None disclosed.*

Corresponding Author: *Colin P. West, MD, PhD; Department of Medicine, Mayo Clinic, 200 First Street SW, Rochester, MN 55905, USA (e-mail: west.colin@mayo.edu).*

REFERENCES

1. **Maslach C, Jackson SE, Leiter MP.** Maslach Burnout Inventory Manual. 3rd ed. Palo Alto, CA: Consulting Psychologists Press; 1996.
2. **Thomas NK.** Resident burnout. JAMA. 2004;292:2880–9.
3. **Dyrbye LN, Thomas MR, Massie FS, et al.** Burnout and suicidal ideation among US medical students. Ann Intern Med. 2008;149:334–41.
4. **Golub JS, Johns MM, Weiss PS, Ramesh AK, Ossoff RH.** Burnout in academic faculty of otolaryngology-head and neck surgery. Laryngoscope. 2008;118:1951–6.
5. **Sharma A, Sharp DM, Walker LG, Monson JR.** Stress and burnout among colorectal surgeons and colorectal nurse specialists working in the National Health Service. Colorectal Dis. 2008;10:397–406.
6. **Soler JK, Yaman H, Esteva M, Dobbs F.** Burnout in European family doctors: the EGPRN study. Fam Pract. 2008;25:245–65.
7. **Trufelli DC, Bensi CG, Garcia JB, et al.** Burnout in cancer professionals: a systematic review and meta-analysis. Eur J Cancer Care. 2008;17:524–31.
8. **Shanafelt TD, Bradley KA, Wipf JE, Back AL.** Burnout and self-reported patient care in an internal medicine residency program. Ann Intern Med. 2002;136:358–67.
9. **West CP, Huschka MM, Novotny PJ, et al.** Association of perceived medical errors with resident distress and empathy: a prospective longitudinal study. JAMA. 2006;296:1071–8.
10. **Thomas MR, Dyrbye LN, Huntington JL, et al.** How do distress and well-being relate to medical student empathy? A multicenter study. J Gen Intern Med. 2007;22:177–83.
11. **Gopal R, Glasheen JJ, Miyoshi TJ, Prochazka AV.** Burnout and internal medicine resident work-hour restrictions. Arch Intern Med. 2005;165:2595–600.
12. **Rosen IM, Gimotty PA, Shea JA, Bellini LM.** Evolution of sleep quantity, sleep deprivation, mood disturbances, empathy, and burnout among interns. Acad Med. 2006;81:82–5.
13. **Maslach C, Jackson SE.** The measurement of experienced burnout. J Occ Behav. 1981;2:99–113.
14. **Gil-Monte PR.** Factorial validity of the Maslach Burnout Inventory (MBI-HSS) among Spanish professionals. Rev Saude Publica. 2005; 39:1–8.
15. **Kanste O, Miettunen J, Kyngas H.** Factor structure of the Maslach Burnout Inventory among Finnish nursing staff. Nurs Health Sci. 2006;8:201–7.
16. **Vanheule S, Rosseel Y, Vlerick P.** The factorial validity and measurement invariance of the Maslach Burnout Inventory for human services. Stress Health. 2007;23:87–91.
17. **Shanafelt TD, West CP, Sloan JA, et al.** Career fit and burnout among academic faculty. Arch Intern Med. 2009;169:990–5.
18. **Shanafelt TD, Balch CM, Bechamps G et al.** Burnout and career satisfaction among American surgeons. Ann Surg. 2009; In press.