

Validation of the Mini Z

The Mini Z survey is derived from the “Z” Clinician Questionnaire (for Zero Burnout Program). The Z was adapted from prior work performed in the Physician Worklife Survey (Linzer 2000, Williams 2001) and MEMO (Linzer, Ann Intern Med, 2009). The Mini Z is comprised of 10 items and one open ended question. The 10 items assess satisfaction, stress, burnout, work control, chaos, values alignment, teamwork, documentation time pressure, excess electronic medical record (EMR) use at home, and EMR proficiency.

The single item burnout question is adapted from Freeborn’s tedium index (Schmoldt, Freeborn 1994) and has been validated externally against the Maslach Burnout Inventory, or MBI, (Rohland 2004) with very good correlations ($r = 0.65$) and ANOVA-calculated r squared (0.5). The single item measure also performed comparably to the MBI in a comparison study of Dutch and US physicians (Linzer 2001).

The other nine items of the Mini Z are either additional outcomes (stress and satisfaction), or potential drivers of burnout (control, chaos, time pressure, teamwork, EMR use at home, EMR proficiency, and values alignment).

The Mini Z survey was assessed for internal consistency in surveys administered to Hennepin County Medical Center’s physicians and other healthcare providers with an FTE of 0.5 or higher (603 clinicians sampled, 61% response rate). The overall 10 items were found to have a Cronbach’s alpha of 0.8. Factor analysis (see Table 1) determined two scales (EMR/stress, and teamwork/values) with reasonable alphas of 0.72 and 0.74, respectively (Shimotsu [abstract], 2015, see attached poster).

A correlational analysis of burnout drivers in the Mini Z with the externally validated single item burnout measure showed virtually all variables associated with the burnout item at the $p < 0.001$ level with r values of 0.26 to 0.46 (Table 2) for the major burnout predictors (control, EMR use, chaos, lack of teamwork, lack of values alignment). These findings are published in a paper on work life and wellness in General Internal Medicine (Linzer, JGIM 2016). Satisfaction and high stress were also correlated with the burnout item (0.57 and 0.64, respectively.)

The Mini Z was validated externally against the full MBI, the results of which are published in a recent paper on the workplace stressors associated with burnout (Olson, Stress and Health 2018). There were strong correlations between the Mini Z stressors and burnout using either the internal single-item burnout measure or the external MBI, with correlations of $p < 0.05$ for six of seven stressors. There were significant associations between most stressors and the three domains of the MBI ($p < 0.001$), with the exception of proficiency with the EMR (Table 3). The odds ratios for the mini z predictors of burnout are similar in rank and proportion when calculated by the Mini Z’s internal single-item burnout metric compared with the MBI’s, suggesting construct validation for the comprehensive 10-item Mini Z.

Future work to further validate the Mini Z would include assessing tests of responsiveness and test-retest reliability. Our worklife research team in the Office and Institute for Professional Worklife at Hennepin Healthcare welcomes collaboration in these efforts. Contact us at opw@hcmcd.org.

Table 1. Reliability Coefficients of Global Measures for 10 item Mini Z survey tool

	Full Sample		Developmental Sample		Cross Validation Sample	
	Items Used	Coefficient Alpha	Items Used	Coefficient Alpha	Items Used	Coefficient Alpha
Global Measures						
Overall*	10	0.80				
Satisfaction	3	0.68	3	0.67	3	0.68
Stress/Burnout	4	0.75	4	0.76	4	0.74
EMR Stress	3	0.56	3	0.60	3	0.50
Revised [±]						
Teamwork and Values ^{±±}	4	0.74	4	0.73	4	0.74
Stress and EMR	4	0.72	4	0.72	4	0.69

* Based on a priori hypotheses from MEMO (Minimizing Error Maximizing Outcome) study.⁶

± Revised subscales based on findings from Confirmatory Factor Analysis.

±± Sub-scale includes these factors: low satisfaction, burnout, lack of values alignment with leader, and low teamwork.

|| Sub-scale includes high stress, poor time for documentation, chaos, and high amount of EMR time at home.

EMR = Electronic Medical Record

Table 2: Pearson Correlation Coefficients of Mini Z Items

Pearson Correlation Coefficients

Probability $>|r|$ under $H_0: \rho=0$

	Satisfaction	Stress	Burnout	Control	Documentation time	Chaos	Values alignment	Teamwork	EMR time at home	EMR proficiency
Satisfaction	1.00000									
Stress	0.36503 <.0001	1.00000								
Burnout	0.56907 <.0001	0.64367 <.0001	1.00000							
Control	0.44821 <.0001	0.41374 <.0001	0.45544 <.0001	1.00000						
Documentation time	0.27512 <.0001	0.47050 <.0001	0.39156 <.0001	0.52081 <.0001	1.00000					
Chaos	0.23406 <.0001	0.37398 <.0001	0.37680 <.0001	0.30487 <.0001	0.38558 <.0001	1.00000				
Values alignment	0.48434 <.0001	0.24420 <.0001	0.37952 <.0001	0.32138 <.0001	0.14437 0.0057	0.11424 0.0289	1.00000			
Teamwork	0.39182 <.0001	0.27273 <.0001	0.30438 <.0001	0.37758 <.0001	0.25382 <.0001	0.21509 <.0001	0.36137 <.0001	1.00000		
EMR time at home	0.05539 0.2905	0.39155 <.0001	0.25523 <.0001	0.26868 <.0001	0.54827 <.0001	0.24518 <.0001	0.04777 0.3621	0.12307 0.0185	1.00000	
EMR proficiency	0.09741 0.0627	0.13856 0.0079	0.15292 0.0034	0.15792 0.0024	0.21042 <.0001	0.08187 0.1179	0.09972 0.0566	0.08975 0.0864	0.10527 0.0441	1.00000

EMR = Electronic Medical Records

Table 3: Associations between Mini-Z stressors and burnout, comparing burnout defined by (a) MBI, and (b) Mini-Z*

Mini Z workplace stressor:	MBI Burnout (22-item)				Mini Z Burnout			
	OR	95% CI	p-value	pseudoR ²	OR	95% CI	p-value	pseudoR ²
Control over workload	8.24	4.81-14.11	<0.001	0.26	7.60	4.40-13.14	<0.001	0.21
Teamwork	7.61	3.28-17.67	<0.0001	0.19	3.78	1.98-7.20	<0.001	0.13
Time for documentation	5.83	3.35-10.15	<0.001	0.21	5.55	3.05-10.10	<0.001	0.17
Work atmosphere	3.49	2.12-5.74	<0.001	0.19	2.95	1.78-4.88	<0.001	0.13
Values aligned with leaders	3.27	1.98-5.41	<0.001	0.18	2.80	1.72-4.57	<0.001	0.13
Time on EMR at home	1.99	1.21-3.27	0.007	0.15	1.89	1.14-3.14	0.013	0.11
EMR proficiency	2.12	0.95-4.75	0.067	0.14	1.65	0.74-3.69	0.222	0.10

Note. EMR: electronic medical record; MBI: Maslach Burnout Inventory. (adjusted for practice, specialty, age, race, and gender). 22-item MBI Burnout defined EE ≥ 27 and/or DP ≥ 10 , calculated from MBI (EE 0–54, DP 0–30, PA 0–32). Mini-Z own-definition of Burnout (1–5) defined as ≥ 3 . 3 = “burning out”, 4 = “experiencing burnout symptoms that will not go away”, 5 = “completely burned out”.

*Table Reference: Olson, Kristine, et al. Cross-sectional survey of workplace stressors associated with physician burnout measured by the Mini-Z and the Maslach Burnout Inventory. *Stress and Health*, 2018; 35: 157– 175.

References:

1. Linzer M, Konrad TR, Douglas J, McMurray JE, Pathman D, Williams E, et al. Managed care, time pressure and physician job satisfaction. *J Gen Intern Med.* 2000;15(7):441-50.
2. Williams ES, Konrad TR, Scheckler WE, et al.. Understanding physicians' intentions to withdraw from practice: The role of job satisfaction, job stress, mental and physical health. *Health Care Mgmt Rev.* 2001;26(1):7-19.
3. Linzer M, Manwell LB, Williams ES, et al. Working conditions in primary care: physician reactions and care quality. *Ann Intern Med.* 2009;151:28-36.
4. Schmoldt RA, Freeborn DK, Klevit HD. Physician burnout: recommendations for HMO managers. *HMO Pract.* 1994;8:58– 66.
5. Rohland BM, Kruse GR, Rohrer JE. Validation of a single-item measure of burnout against Maslach Burnout Inventory among physicians. *Stress and Health.* 2004;20: 75-9.
6. Linzer M, Visser MRM, Oort FJ, et al. Predicting and preventing physician burnout: Results from the United States and the Netherlands. *Am J Med.* 2001;111(2):170-75.
7. Shimotsu S, Poplau S, Linzer M. Validation of a brief clinician survey to reduce clinician burnout. Presented as a poster presentation at the Annual Meeting of the Society of General Internal Medicine, Toronto, Canada. April 2015. *J Gen Intern Med.* S79-80.
8. Linzer M, Poplau S, Babbott S, et al. Worklife and wellness in academic GIM. *J Gen Intern Med.* 2016; 31(9): 1004-1010.
9. Olson, Kristine, et al. Cross-sectional survey of workplace stressors associated with physician burnout measured by the Mini-Z and the Maslach Burnout Inventory. *Stress and Health,* 2018; 35: 157– 175.