The Mini Z Worklife and Burnout Reduction Instrument: Psychometrics and Clinical Implications

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INTRODUCTION

Stress and burnout among healthcare workers are at alarming levels.[1] The Mini Z (Zero Burnout Program) worklife measure for clinicians was derived from validated instruments with the factor structure published in *JGIM* in 2016.[2] The 1.0 version included 4 work conditions (work ambience (chaos), work control, teamwork effectiveness, and values alignment), 3 clinician reactions (stress, satisfaction, and burnout), and 3 items related to electronic medical record (EMR) stress (time pressure, home EMR time, and EMR proficiency). This paper investigates the psychometric structure of the 2.0 version which (1) changes EMR proficiency to EMR frustration, (2) aligns positive scores for calculation of a summary (joy) score, and (3) has two 5-item subscales (supportive work environment and work pace/EMR stress). Mini Zs have been adapted for residents, nurses, and administrators, and administered to thousands of healthcare workers in multiple languages across 5 continents. Concurrent validity of the burnout item was assessed with the Maslach Burnout Inventory (MBI) emotional exhaustion (EE) subscale.[3] A subsequent study assessed convergent validity of the remaining items against EE and depersonalization MBI subscales.[4] To provide a brief, valid measure for healthcare organizations to address clinician satisfaction and burnout, we determined the reliability and validity of the Mini Z 2.0's two-subscale structure.

METHODS

A convenience sample of 7675 respondents (67% physicians, 59% female, and 72% white, in 80 organizations from 23 states) was assembled for the analysis from the American Medical Association burnout assessment program. Cronbach's alpha and McDonald's Omega coefficients assessed internal consistency (values > 0.7 acceptable to good for group-level measurement, as in PROMIS Measurement Standards, 2013). An inter-correlation matrix assessed item correlations. Confirmatory factor analysis models were constructed for the Mini Z 2.0 (5 items in each subscale), with confirmatory analysis examining significance of the loadings, as well as modification indices in a revised version with different subscale configurations based upon optimal factor scores and an overall unidimensional composite. For model fit, assessed using the comparative fit index (CFI), Tucker-Lewis index (TLI), standardized root mean residual (SRMR), and root mean square error of approximation (RMSEA), cut values[5] indicating good fit included CFI and TLI > 0.95, SRMR < 0.05, and RMSEA < 0.08. Latent structural regression models assessed convergent validity of the new factors in relation to the PHQ2 depression index, and two items of self-rated home EMR use.

RESULTS

Table 1 demonstrates internal consistency and confirmatory factor analysis loadings for the two 5-item factor structure (alphas 0.75–0.83, omegas 0.82–0.86). In models 1 and 2, "supportive work environment" includes satisfaction, burnout, values alignment, teamwork, and work control, while "work pace/EMR stress" includes stress, chaos, home EMR, documentation time pressure, and EMR frustration; a bifactor analysis demonstrated good performance as either two domains or a 10 item measure. A subsequent confirmatory analysis (models 3 and 4) with a 7-item subscale (the original 5 items plus stress and chaos), and 3 EMR items (Fig. 1), had better fit indices (improved CFI, TLI, RMSR, and RMSEA) and reasonable performance of a bifactor model. A general factor model (model 5) showed good performance as a 10-item single domain. An inter-correlation matrix demonstrated good correlations ($r > 0.3$) between 80% of items ($ps < 0.001$). Convergent validity determinations (supplemental figures) confirmed a two-subscale structure, with better model fit for the 7- and 3-item structure versus the 5 and 5. The PHQ2 depression questions correlated with the supportive work environment factor, but not the EMR subscale.

DISCUSSION

In a 10-question instrument, the Mini Z provides information on satisfaction, burnout, and remediable work conditions. Due to the clinical utility of this parsimonious

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Table 1 Standardized Confirmatory Factor Analysis (CFA) Loadings for the MINI Z

	Original model			Revised model			
	Model 1		Model 2	Model 3		Model 4	Model 5
Items	Factor 1	Factor 2	Bifactor	Factor 1	Factor 2	Bifactor	General factor
Satisfaction	0.808		0.677	0.806		0.668	0.784
Burnout	0.848		0.826	0.831		0.826	0.810
Values	0.718		0.555	0.720		0.545	0.695
Teamwork	0.655		0.543	0.658		0.536	0.632
Control	0.716		0.722	0.717		0.724	0.689
Stress		0.822	0.815	0.772		0.806	0.751
Chaos		0.611	0.639	0.605		0.630	0.581
EMR time pressure		0.791	0.593		0.953	0.591	0.742
Home EMR time		0.684	0.434		0.758	0.430	0.647
EMR frustration		0.538	0.387		0.629	0.386	0.504
Model fit							
CFI	0.863		0.982	0.954		0.982	0.841
TLI	0.819		0.968	0.939		0.967	0.795
RMSEA	0.190		0.080	0.110		0.081	0.202
SRMR	0.074		0.022	0.040		0.022	0.083
Cronbach alpha	0.83	0.75	0.85	0.85	0.78	0.85	0.85
Omega	0.86	0.82	0.86	0.90	0.83	0.86	0.90
Reliability attrition	3.5%	8.5%		5.5%	6.0%		5.5%

Note: Only single domain estimates are provided for bifactor models (sub-domains are not reported). The following values indicate good model fit[5]*: CFI and TLI > 0.95, SRMR < 0.05, and RMSEA < 0.08. The bifactor model indicates a single general factor with sub-domains; the general factor model indicates a single overall domain*
CFI comparative fit index, TFI Tucker-Lewis index, SRMR standardized root mean residual, RMSEA root mean square error of approximation, EMR electronic medical record

worklife measure,[6] its use has expanded rapidly. In this analysis, we confirm a two domain structure, with a satisfactory unidimensional composite. Thus, organizations can portray an overall "joy score" and use the two original subscales which have good internal consistency. We have also determined that a different configuration of subscale items (now called the Mini Z 3.0) has better performance, with a 7-item subscale of work conditions and clinician reactions, and a 3-item EMR-related subscale. One limitation is that no independent measure of home EMR use was available; another is that the Mini Z 3.0 will need validation against the MBI.

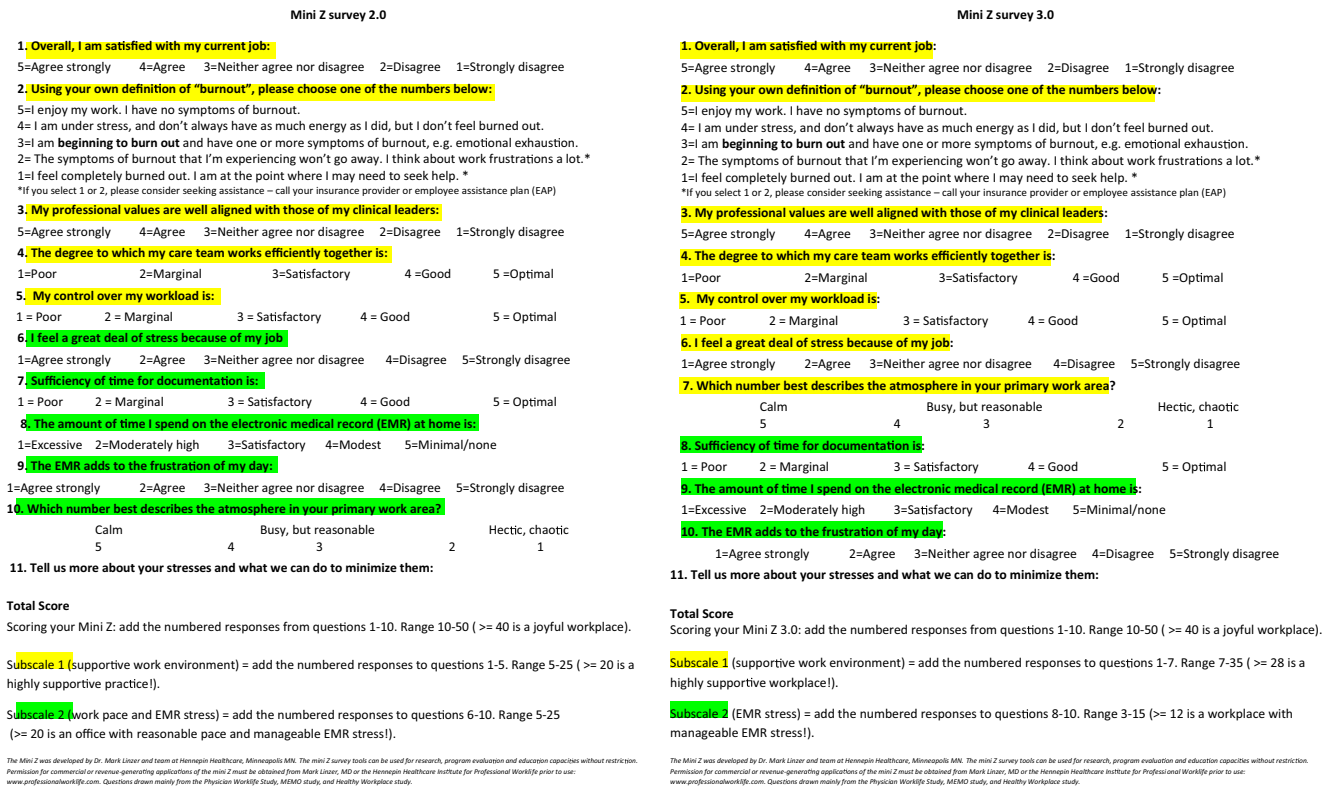

Figure 1. Mini Z items: original 2.0 factor structure (5 and 5-item subscales) vs new 3.0-factor structure (7 and 3 items)

Supplementary Information *The online version contains supplementary material available at https://doi.org/10.1007/s11606-021-07278-3.*

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Mark Linzer, MD[1]
Colleen McLoughlin, MPH[2]
Sara Poplau, BA[1]
Elizabeth Goelz, MD[1]
Roger Brown, PhD[3]
Christine Sinsky, MD[2]

[1]Department of Medicine and Institute for Professional Worklife, Hennepin Healthcare System,
701 Park Avenue (G5), Minneapolis, MN 55415, USA
[2]American Medical Association,
Chicago, IL, USA
[3]University of Wisconsin School of Nursing,
Madison, WI, USA

Corresponding Author: *Mark Linzer, MD; Department of Medicine and Institute for Professional Worklife, Hennepin Healthcare System, 701 Park Avenue (G5), Minneapolis, MN 55415, USA (e-mail: mark.linzer@hcmed.org).*

Declarations:

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