SUPPLEMENTAL MATERIALS

Supplemental Material 1. The descriptive statistics, skewness and kurtosis of variables

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| **Variables** | **Mean±SD** | **Min** | **Max** | **Skewness** | **Kurtosis** |
| **Job Demand (1~4)** |  |  |  |  |  |
| **S1** | 2.44±0.65 | 1 | 4 | 0.55 | -0.04 |
| **S2** | 2.67±0.72 | 1 | 4 | 0.17 | -0.51 |
| **S3** | 2.90±0.62 | 1 | 4 | -0.17 | 0.17 |
| **ERI (1~4)** |  |  |  |  |  |
| **S4** | 2.73±0.58 | 1 | 4 | -0.71 | 0.8 |
| **S5** | 2.72±0.41 | 1 | 4 | -0.44 | 0.35 |
| **S6** | 2.71±0.59 | 1 | 4 | -0.6 | 0.53 |
| **Burnout (1~7)** |  |  |  |  |  |
| **B1** | 3.02±1.56 | 1 | 7 | 1.56 | 2.42 |
| **B2** | 2.99±1.63 | 1 | 7 | 0.67 | -0.42 |
| **B3** | 3.54±1.82 | 1 | 7 | 0.29 | -1.01 |
| **B4** | 3.12±1.77 | 1 | 7 | 0.59 | -0.67 |
| **B5** | 2.90±1.68 | 1 | 7 | 0.84 | -0.11 |
| **Trauma (1~5)** |  |  |  |  |  |
| **T1** | 2.93±1.01 | 1 | 5 | -0.03 | -0.65 |
| **T2** | 2.29±0.99 | 1 | 5 | 0.47 | -0.36 |
| **T3** | 2.50±1.00 | 1 | 5 | 0.38 | -0.49 |
| **T4** | 2.49±0.95 | 1 | 5 | 0.45 | -0.39 |
| **T5** | 2.18±0.98 | 1 | 5 | 0.71 | 0.1 |
| **Violence (1~4)** |  |  |  |  |  |
| **V1** | 2.66±0.76 | 1 | 4 | -0.44 | -0.06 |
| **V2** | 1.84±0.63 | 1 | 4 | 0.49 | 0.99 |
| **V3** | 2.28±0.77 | 1 | 4 | 0.08 | -0.44 |
| **V4** | 2.14±0.72 | 1 | 4 | 0.34 | 0.06 |
| **V5** | 1.89±0.68 | 1 | 4 | 0.46 | 0.31 |
| **PTSD score (0~51)** | 4.31±6.05 | 0 | 48 | 2.55 | 9.54 |



**Supplemental Material 2.** **Specification of a structural equation model for the Effect of Burnout on PTSD Symptoms in Firefighters, including mediating and effects of trauma. The model was fitted to the self-reported data of firefighters collected in the FRESH study (2016–2017). Rectangles indicate observed variables, and ellipses represent latent variables/constructs. Single-headed arrows indicate a directional effect**.

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| **Supplemental Material 3. The summary of goodness of ﬁt indices for the hypothesized SEM model** |
|  | **Fit Index** | **Value** |
| **Absolute Fit Index** | χ2 | 452.458 (p<.001) |
| GFI (Goodness of Fit Index) | 0.927 |
| RMSEA (Root Mean Square Error of Approximation) | 0.049 (0.043, 0.055) |
| SRMR (Standardized Root Mean Square residual) | 0.04 |
| ECVI (Expected Cross-Validation Index) | 1.051 |
| **Incremental Fit Index** | CFI (Comparative Fit Index) | 0.96 |
| TLI (Tucker-Lewis Index) | 0.953 |
| NFI (Bentler-Bonett Normed Fit Index) | 0.931 |
| NNFI (Bentler-Bonett Non-normed Fit Index) | 0.953 |
| RNI (Relative Noncentrality Index) | 0.960  |
| RFI (Bollen's Relative Fit Index) | 0.919  |
| IFI (Bollen's Incremental Fit Index) | 0.960  |
| **Parsimonious Fit Index** | Normed χ2 (χ2/df) | 2.357  |
| AIC (Akaike Information Criteria) | 27291.932  |
| AGFI (Adjusted Goodness of Fit Index) | 0.906  |
| PNFI (Parsimony Normed Fit Index) | 0.798  |
| PGFI (Parsimony Goodness of Fit Index) | 0.725  |

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| **Supplemental Material 4. Path analysis of the hypothesized SEM model** |
| **Hypothesis** | **Path** | **Unstandardized parameters** | **Standardized parameters** | **Two-tailed p-value** | **Acceptancy** |
| **B** | **SE** | **β** | **C.R.** |
| H1a | Job Demand → Burnout | 1.121  | 0.137  | 0.411  | 8.171  | <0.001 | Accept |
| H1b | ERI → Burnout | -0.944 | 0.148 | -0.290  | -6.368 | <0.001 | Accept |
| H2 | Trauma → Burnout | 0.215  | 0.068  | 0.131  | 3.172  | 0.001 | Accept |
| H3 | Violence → PTSD | 1.337  | 0.551  | 0.123  | 2.428  | 0.014 | Accept |
| H4 | Trauma → PTSD | 0.622  | 0.358  | 0.085  | 1.736  | 0.081 | Reject |
| H5 | Burnout → PTSD | 1.060  | 0.200  | 0.237  | 5.308  | <0.001 | Accept |
| B=Unstandardized estimate; SE=Standard Error; β=Standardized estimate; C.R.: Critical ratio |

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| **Supplemental Material 5. Moderating effect of Trauma on PTSD** |
|  | **Test Statistic** | **S.E.** | **Two-tailed p-value** |
| **Sobel test**  | 2.715  | 0.091  | 0.012  |
| **Aroian test** | 2.475  | 0.092  | 0.013  |
| **Goodman test** | 2.551  | 0.089  | 0.011  |
| http://www.quantpsy.org/sobel/sobel.htm |  |  |
| Details can be found in Sobel (1982), Goodman (1960), and MacKinnon, Warsi, and Dwyer (1995).  |

Figure 2

Supplemental Material 6. Mediation of impact of trauma on PTSD through burnout(left) and result of Sobel test(right).

a = effect of Trauma on Burnout; b = effect of Trauma on PTSD; C = total effect of Trauma on PTSD; Sa = Standard error of path coefficients a; Sb = Standard error of path coefficients b; and a, b and C mean unstandardized parameters. Continuous arrows indicate significant effect while dashed arrows signify non-significant effects.

PTSD

a(Sa)

b(Sb)

C’

PTSD

0.215(0.074)

1.060(0.212)

0.622(0.361)