Appendix 1: Balance Assessment of Stress and Energy (BASE)

This appendix presents the items of BASE in English and Dutch. For this study, BASE was administered in Dutch. Translation of all items are presented here to facilitate reading. For each item, a 5-point scale measured the extent to which the item has been experienced during the past six to eight weeks, ranging from 1 (not at all) to 5 (to a very large extent).

BASE items in English

Stressors

In the past 6-8 weeks, to what extent have you experienced…

| Item                                                                 | 1 | 2 | 3 | 4 | 5 |
|----------------------------------------------------------------------|---|---|---|---|---|
| 1. High work pressure                                               |   |   |   |   |   |
| 2. Inadequate facilities                                            |   |   |   |   |   |
| 3. Immediate colleagues having insufficient knowledge/skills, or being inflexible |   |   |   |   |   |
| 4. Burdensome regulations and procedures                           |   |   |   |   |   |
| 5. Poor cooperation with colleagues from other departments within your own organization |   |   |   |   |   |
| 6. Poor cooperation with external partners                         |   |   |   |   |   |
| 7. A supervisor who is inarticulate or incompetent                  |   |   |   |   |   |
| 8. Unit/agency reorganization and/or restructuring                  |   |   |   |   |   |
| 9. Difficulty switching between work and home                       |   |   |   |   |   |
| 10. Contact with suicidal individuals                               |   |   |   |   |   |
| 11. Experiencing aggression or violence                             |   |   |   |   |   |
| 12. Being responsible for a safety mistake                         |   |   |   |   |   |
| 13. Unsafe work situations                                          |   |   |   |   |   |
| 14. Negative media coverage regarding your organization             |   |   |   |   |   |
| 15. An accumulation of suicide-related turnouts within a short period |   |   |   |   |   |
| 16. Stress at home                                                  |   |   |   |   |   |

Note. 1 = not at all, 2 = a little, 3 = to some extent, 4 = to a great extent, 5 = to a very great extent.
Resources

In the last 6-8 weeks, to what extent have you gotten energy from…

| Item                                                                 | 1 | 2 | 3 | 4 | 5 |
|----------------------------------------------------------------------|---|---|---|---|---|
| 17. Support from colleagues                                         |   |   |   |   |   |
| 18. Bringing an incident to a successful conclusion                 |   |   |   |   |   |
| 19. Humor of and among colleagues                                   |   |   |   |   |   |
| 20. Good cooperation with immediate colleagues in the team          |   |   |   |   |   |
| 21. Positive challenges at work                                     |   |   |   |   |   |
| 22. Experiencing autonomy                                           |   |   |   |   |   |
| 23. Contact with travelers and transport operators                  |   |   |   |   |   |
| 24. Opportunities for personal development                          |   |   |   |   |   |
| 25. Recognition and appreciation from management, the organization, external parties, or travelers |   |   |   |   |   |
| 26. The fact that management takes my suggestions for improvement seriously |   |   |   |   |   |

Note. 1 = not at all, 2 = hardly, 3 = to some extent, 4 = to a large extent, 5 = to a very large extent.

Personal characteristics

To what extent do you agree with the following statements:

| Item                                                                 | 1 | 2 | 3 | 4 | 5 |
|----------------------------------------------------------------------|---|---|---|---|---|
| 27. I unwind by exercising, spending time with others, enjoying music, or pursuing other hobbies |   |   |   |   |   |
| 28. I am able to keep emotional distance from the work               |   |   |   |   |   |
| 29. I receive support from my partner, family and/or friends         |   |   |   |   |   |
| 30. I have a stable home environment                                 |   |   |   |   |   |
| 31. I am able to switch easily between tasks                        |   |   |   |   |   |
| 32. I am sociable                                                    |   |   |   |   |   |
| 33. I am flexible                                                    |   |   |   |   |   |

Note. 1 = not at all, 2 = hardly, 3 = to some extent, 4 = to a large extent, 5 = to a very large extent.
**BASE (Zelfscreener voor balans op het werk) in Dutch**

**Stressoren**

In hoeverre heb je de afgelopen periode (6-8 weken) last gehad van…

| Item                                                                 | 1 | 2 | 3 | 4 | 5 |
|----------------------------------------------------------------------|---|---|---|---|---|
| 1. Een hoge werkdruk                                              |  |   |   |   |   |
| 2. Gebrekkige faciliteiten                                       |  |   |   |   |   |
| 3. Directe collega’s die te weinig kennis/kunde hebben, of niet flexibel zijn |  |   |   |   |   |
| 4. Lastige regelgeving en werkwijzen                              |  |   |   |   |   |
| 5. Gebrekkige samenwerking met collega’s van andere afdelingen binnen de eigen organisatie |  |   |   |   |   |
| 6. Gebrekkige samenwerking met externe partners                   |  |   |   |   |   |
| 7. Een leidinggevende die onduidelijk of onkundig is              |  |   |   |   |   |
| 8. De reorganisatie                                               |  |   |   |   |   |
| 9. Moeilijk kunnen schakelen tussen werk en privé                  |  |   |   |   |   |
| 10. Contact met suïcidale personen                                |  |   |   |   |   |
| 11. Het meemaken van agressie of geweld                           |  |   |   |   |   |
| 12. Het maken van een veiligheidsfout                            |  |   |   |   |   |
| 13. Onveilige werksituaties                                      |  |   |   |   |   |
| 14. Negatieve berichtgeving in de media over jouw organisatie     |  |   |   |   |   |
| 15. Een stapeling van het aantal uitrukken met betrekking tot suicides in korte tijd |  |   |   |   |   |
| 16. Stress in je thuissituatie                                    |  |   |   |   |   |

*Note. 1= niet, 2= nauwelijks, 3= in enige mate, 4= in sterke mate, 5= in zeer sterke mate.*

**Energiebronnen**

In hoeverre haalde je de afgelopen periode (6-8 weken) energie uit…

| Item                                                                 | 1 | 2 | 3 | 4 | 5 |
|----------------------------------------------------------------------|---|---|---|---|---|
| 17. Steun van collega’s                                           |  |   |   |   |   |
| 18. Een incident tot een goed einde brengen                        |  |   |   |   |   |
| 19. De humor van en met collega’s                                 |  |   |   |   |   |
| 20. Een goede samenwerking binnen het team van directe collega’s   |  |   |   |   |   |
Persoonlijke kenmerken

In hoeverre ben je het eens met de volgende uitspraken.

| Item                                                                 | 1 | 2 | 3 | 4 | 5 |
|----------------------------------------------------------------------|---|---|---|---|---|
| 27. Ik vind afleiding in sport, sociale contacten, muziek of andere hobby's |   |   |   |   |   |
| 28. Ik kan emotioneel afstand bewaren tot het werk                   |   |   |   |   |   |
| 29. Mijn partner, familie en/of vrienden geven mij steun             |   |   |   |   |   |
| 30. Mijn thuissituatie is stabiel                                   |   |   |   |   |   |
| 31. Ik kan snel schakelen                                           |   |   |   |   |   |
| 32. Ik ben sociaal                                                  |   |   |   |   |   |
| 33. Ik ben flexibel                                                 |   |   |   |   |   |

Note. 1 = niet, 2 = nauwelijks, 3 = in enige mate, 4 = in sterke mate, 5 = in zeer sterke mate.
Appendix 2: Measures

**Measures**

**Burn-out.** We used the Dutch version of the Maslach Burnout Inventory–General Survey (Utrecht Burn-out Scale) to assess burn-out symptoms. We included the subscales exhaustion (five items) and cynicism (four items) (Schaufeli et al., 2001; Schaufeli & Van Dierendonck, 2000; Schutte et al., 2000). We have chosen to only include exhaustion and cynicism because these two dimensions are considered the main dimensions of burn-out (Schaufeli et al., 2009). Moreover, it is questioned whether reduced personal accomplishment is a constituting element of burnout (Schaufeli & Taris, 2005; Te Brake et al., 2007). In addition, personal accomplishment shows high correlation with personal efficacy (Shoji et al., 2016), a dimension we already measure with the Resilience Evaluation Scale (see below). The MBI items are rated on a 7-point scale ranging from 0 (never) to 6 (always/daily). In this sample, internal consistency of the scales was high (Cronbach’s alphas were .92 and .87 respectively). The cut-off scores for inclusion in telephone interview were set at average complaints or worse on exhaustion (mean score of ≥ 0.99) or on cynicism (mean score of ≥ 0.49). We chose to include burn-out because based on other studies, we expected BASE’s stressors and resources to be associated with burn-out (Bakker & Demerouti, 2007).

**Work engagement.** We used the Dutch shortened version of the Utrecht Work Engagement Scale to measure work engagement, concerning subscales vigor (three items), absorption (three items) and dedication (three items) (Schaufeli et al., 2006). The items are rated on a 7-point scale ranging from 0 (never) to 6 (always/daily). Internal consistency of the scales was high (Cronbach’s alphas were .87, .82 and .89 respectively). We included work engagement because based on other studies, we expected BASE’s resources and personal characteristics to be associated with work engagement (Bakker & Demerouti, 2007; Barbier et al., 2013).

**Depression, anxiety and stress.** We assessed depression (seven items), anxiety (seven items) and stress (seven items) with the Dutch short version of the Depression Anxiety Stress scale (de Beurs et al., 2001; Lovibond & Lovibond, 1995). Internal consistency of the scales was acceptable or high (Cronbach’s alphas .80, .71 and .92 respectively). A 4-point scale measures the extent to which each state has been experienced over the past week ranging from 0 (did not apply to me at all) to 3 (applied to me very much, or most of the time). To determine cut-off values, DASS-21 scores were multiplied by two, according to the scale’s manual. Cut-off scores for inclusion in telephone interview were set at normal symptoms or
worse on depression (≥ 9) or anxiety (≥ 7) or stress (≥ 14). We included the DASS-21 to measure common psychological complaints among Dutch railway first responders and to make sure respondents with minimal psychological complaints would be included in the telephone interviews.

**PTSD-symptoms.** The Dutch version of the PTSD Checklist for DSM-5 (PCL-5) was used to measure PTSD-symptoms (Blevins et al., 2015; Weathers et al., 2013). The PCL-5 is a 20-item self-report measure divided into four subscales: intrusion (five items, cluster B), avoidance (two items, cluster C), negative alterations in cognitions and mood (seven items, cluster D) and alterations in arousal and reactivity (six items, cluster E). The items are answered on a 5-point scale ranging from 0 (not at all) to 4 (extremely). Internal consistency of these scales was high (Cronbach’s alphas were .88, .84, .87 and .81 respectively). The cut-off scores for minimum symptom levels treated each item rated as 2 (moderately) or higher, as a symptom endorsed. Cut-off scores set at one B item, or one C item, or two D items or two E items (Weathers et al., 2013). We included the PCL-5 to measure PTSD symptoms among Dutch railway first responders, given the fact they are exposed to potentially traumatic events during their work on a regular basis. In addition, we included the PCL-5 to make sure respondents with minimal PTSD complaints would be included in the telephone interviews.

**Social support.** Social support was measured with the shortened Dutch version of the Social Support List (van Sonderen, 2012). It includes daily emotional support (four items), problem emotional support (four items) and esteem (four items). Internal consistency of the scales was high (Cronbach’s alphas were .81, .81 and .82 respectively). Items are rated on a 4-point scale ranging from 1 (never) to 4 (very often). Based on other research, we know that support and recognition from supervisors and colleagues after a potentially traumatic event or during work stress are crucial to one’s wellbeing (Gouweloos-Trines et al., 2017; Olff, 2012). Therefore, we expected BASE’s stressors scale to be associated with social support as measured with the SSL-12.

**Psychological resilience.** The Dutch version of the Resilience Evaluation Scale (RES) was used to assess psychological resilience. The RES consisted of nine items, which measured self-confidence (3 items) and self-efficacy (six items). The RES is a valid and reliable instrument (Van der Meer et al., 2018). Items are rated on a 5-point scale ranging from 0 (completely disagree) to 4 (completely agree). Internal consistency of the scales was high (Cronbach’s alphas .88 and .89 respectively). We included psychological resilience to measure the resilience concept as introduced by van der Meer et al. (2018) among Dutch railway emergency personnel. Based on the definition of BASE’s personal characteristics
(Bakker & Demerouti, 2007; Barbier et al., 2013) as used in the current study, we expected the scale to be associated with psychological resilience as measured with the RES.
Appendix 3: Experts

In this study, railway emergency services employees were offered a comprehensive support program, consisting of BASE, targeted follow-up telephone interviews and an optional subsequent face-to-face counseling session. The follow-up telephone interviews were conducted by 7 experts, consisting of certified psychologists and the first author. The psychologists have experience in the field of psychotrauma and were employees of a Dutch organization that is specialized in preventive, acute or curative measures in relation to shocking events and stressful situations at work. Job titles of the experts were: healthcare psychologist, psychotherapist, clinical psychologist or researcher.

In total, the seven experts conducted 69 telephone interviews. The majority of the interviews (47 interviews) was conducted by one expert and the first author. The other five experts conducted between two and seven interviews each. Before the interviews, the experts were informed by the first author about the study, the population and the metrics used during the study. The experts discussed together how to conduct the interview. Experts were asked to complete a standardized form after the interview to substantiate their decision, with the question whether the respondent recognized their BASE outcome and whether the expert agreed or disagreed with the BASE outcome. Differences in terms of judgement were not assessed.

The outcome of the telephone interview was based on the interaction between the expert and the respondent, i.e. the preference of the respondent for receiving counseling was taken into account as well. Out of 61 respondents that received the orange BASE outcome and were included in the analysis, only 18 respondents received counseling. This indicates that the discussion between the expert and the respondent led to a deliberate evaluation of the BASE outcome and decision to refer to counseling.
Appendix 4: Pearson correlations of study variables (N= 102)

| Pearson correlations          | 1    | 2    | 3    | 4    | 5    | 6    | 7    | 8    | 9    |
|-------------------------------|------|------|------|------|------|------|------|------|------|
| 1. Stressors (BASE)           |      |      |      |      |      |      |      |      |      |
| 2. Resources (BASE)           |      |      |      |      |      |      |      |      |      |
| 3. Personal characteristics (BASE) |      |      |      |      |      |      |      |      |      |
| 4. Burn-out symptoms (MBI)    |      |      |      |      |      |      |      |      |      |
| 5. Work engagement (UWES)     |      |      |      |      |      |      |      |      |      |
| 6. Depression, anxiety and stress (DASS-21)<sup>a</sup> |      |      |      |      |      |      |      |      |      |
| 7. PTSD symptoms (PCL-5)<sup>b</sup> |      |      |      |      |      |      |      |      |      |
| 8. Social support (SSL-12)    |      |      |      |      |      |      |      |      |      |
| 9. Psychological resilience (RES)<sup>b</sup> |      |      |      |      |      |      |      |      |      |

** p < .01; *p < .05; <sup>a</sup>N= 101 <sup>b</sup>N= 100
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