

1 Categorization of work environment factors and stress outcomes

1.1 Work environment risk factors

Table 1: Work environment risk factors and their measurement tools categorized according to the 6th European Working Conditions Suvey [29].

ID	Study reference	Description and measurement tool(s)
Work intensity		
3	[50]	Perceived workload/work demand: Physical demand, mental demand, frustration effort, perceived time pressure, level of performance, measured with National Aeronautics and Space Administration-Task Load Index (NASA-TLX), 10-point Likert scale ranging from ‘low’ (0) to ‘high’ (9).
5	[52]	Workload: Perceived Workload Scale, 3 items.
12	[58]	Daily role conflict: 1 item from an adapted version of the Role Conflict and Ambiguity Scale, scale ranging from ‘I strongly disagree’ (1) to ‘I strongly agree’ (5).
14	[60]	Task demand: Diary of Ambulatory Behavioral States (DABS), 4-point scale ranging from ‘no!!’ to ‘yes!!’.
15	[61]	Job demands: Emotional demands: Ranging from ‘never’ (0) to ‘almost always’ (6). Over the past 3 days. Workload: 2 items of the Job Content Questionnaire (JCQ), 7-point Likert scale ranging from ‘strongly disagree’ (1) to ‘strongly agree’ (7). Over the past 3 days.
16	[62]	Daily workload: 3 items, 7-point scale ranging from ‘totally disagree’ (1) to ‘totally agree’ (7).
18	[64]	Demand: 1 question, how far it can be applied to the characteristics of the task performed at the time of measurement. Wide screen visual analogue scale ranging from ‘0’ to ‘10’ (to evaluate intensity).
18	[64]	Effort: 1 question, how far it can be applied to the characteristics of the task performed at the moment of measurement. Wide screen visual analogue scale ranging from ‘0’ to ‘10’ (to evaluate intensity).
18	[64]	Perceived workload/work demand: Mental demands, physical demands, time pressure, frustration, effort, performance, measured with NASA-TLX, 10-point Likert scale ranging from ‘low’ (0) to ‘high’ (9).
18	[64]	Time pressure: 4 items of the Instrument for Stress Oriented Task Analysis, 5-point scale ranging from ‘very seldom/never’ (1) to ‘very often’ (5).

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ID	Study reference	Description and measurement tool(s)
20	[66]	Time pressure: 4 items of the Instrument for Stress Oriented Task Analysis, 5-point scale ranging from ‘very seldom/never’ (1) to ‘very often’ (5).
22	[68]	Workflow interruptions: Estimation of the number of interruptions during the previous 30 minutes, by sources (doctors, nurses, patients, assistants, technical problems, telephone).
22	[68]	Mental demands: 1) measured during the shift, 1 item from the NASA-TLX, regarding the previous 30 minutes, 20-point scroll bar ranging from ‘very low’ (1) to ‘very high’ (20). 2) measured in the evening, 3 items from the Instrument for Stress-related Task Analysis (ISTA) about concentration demands, 5-point Likert scale ranging from ‘strongly disagree’ (1) to ‘strongly agree’ (5).
22	[68]	Time pressure: 1) measured during the shift, 1 item from the NASA-TLX, regarding the previous 30 minutes, 20-point scroll bar ranging from ‘very low’ (1) to ‘very high’ (20). 2) measured in the evening, 3 items from the ISTA about time pressure, 5-point Likert scale ranging from ‘strongly disagree’ (1) to ‘strongly agree’ (5).
26	[72]	Demands: 9-point Likert scale, ranging from ‘low’ (1) to ‘high’ (9).
28	[74]	Perceived workload/work demand: Mental demands, physical demands, time pressure, frustration, effort, performance, measured with NASA-TLX, 10-point Likert scale ranging from ‘low’ (0) to ‘high’ (9).
29	[75]	Time pressure: 3 items of the Instrument for Stress-Oriented Analysis of Work Scale, 5-point Likert scale ranging from ‘strongly disagree’ (1) to ‘strongly agree’ (5).
29	[75]	Working faster and working longer: 2 items each, Self-Endangering Work Behavior Scale, either ‘no’ (0) or ‘yes’ (1).
32	[78]	Level of subjective pressure: 7-point scale ranging from ‘extreme pressure’ (1) to ‘very little pressure’ (7).
33	[79]	Demand: 5 items, scores ranging from ‘0’ to ‘1’.
33	[79]	Effort: 4 items, scores ranging from ‘0’ to ‘1’.
35	[80]	Job demands: JCQ, 4 items, ranging from ‘strongly disagree’ (1) to ‘strongly agree’ (5).

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ID	Study reference	Description and measurement tool(s)
37	[82]	Workload/work demands: 4 items, conflicting demands on their time, varying levels of demand on their time, difficult work tasks, work tasks that they would prefer not to do. 5-point response scale ranging from ‘not at all’ (1) to ‘a great deal’ (5).
38	[83]	Workload: Mental demands, physical demands, temporal demands, operator performance, effort, frustration, measured with NASA-TLX.
39	[84]	Job demands: 1 item, Likert-type scale, ranging from ‘not demanding at all’ (0) to ‘extremely demanding’ (10).
Working time quality		
2	[49]	Time spent daily on work activities: List of 12 work activities, time spent on it (0: none, 1: <1 hour, 2: 1 to 2 hours, ... 7: >6 hours).
2	[49]	Overtime work: Time spent on all 12 work activities after 18.00 during weekdays and before and after 18:00 during weekends.
5	[52]	Day-to-day cross-domain ICT usage at the workplace: 4 items, 5-point scale ranging from 0 min to 5 min (1), 6 min to 15 min, 16 min to 30 min, 31 min to 60 min, to 60 min or more (5).
5	[52]	Segmentation preference: Segmentation Preference Scale, 4 items.
6	[53]	Family interference with work in the morning: 6 items, occurrence of the events rated either ‘yes’ (1) or ‘no’ (0).
34	[37]	Work-to-family conflict: Work-To-Family Conflict Scale, 5 questions, responses ranging from ‘not at all’ (1) to ‘a lot’ (4).
35	[80]	Daily working hours: In hours and minutes, 1 item.
37	[82]	Hours worked: Total number of hours worked per week.
37	[82]	Work-nonwork interference: Work to nonwork interference and nonwork to work interference. 5-point response scale ranging from ‘not at all’ (1) to ‘a great deal’ (5).
41	[86]	Work hours: In the past 24 hours.

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ID	Study reference	Description and measurement tool(s)
Social environment		
4	[51]	Interpersonal conflict at work: 5-item checklist describing events: ‘I had a fight with a co-worker over a work-related issue’. ‘Co-worker(s) showed disapproval of the way I handled a work situation’. ‘A colleague took jabs at or needled me’. ‘Had to explain an improper behavior or action to co-worker(s) and/or supervisor’. ‘Supervisor showed disapproval of the way I handled a work situation’. During the last 3 hours.
4	[51]	Social support: 6-item checklist: ‘Co-worker helped with a certain task or problem’. ‘Co-worker or customer gave information that helped me in my work’. ‘Co-worker gave advice on how to handle things at work’. ‘Co-worker gave his/her opinion on a problem concerning my work’. ‘Co-worker explained how to perform a certain task or activity’. ‘Supervisor gave advice on how to deal with a certain co-worker or customer’. During the last 3 hours.
7	[54, 76, sub-study 1]	Social interaction record: 13 rating scales about emotional concern, instrumental aid, information, appraisal, companionship. 5-point scale ranging from ‘not’ (1) to ‘to a large extent’ (5). Participants described the most significant interactions (maximum 5) with a minimum duration of 10 minutes (moment when the contact started, duration of contact, whether the other was a colleague, superior, subordinate, rating of the content: rewarding interactions, such as companionship and intimacy, 4 elements of support: emotional, appraisal, information, instrumental).
8	[36]	Co-worker support: 1 item, 5-point Likert scale ranging from ‘not at all’ (1) to ‘very much’ (5).
9	[55]	Daily customer-related social stressors: 16-item scale measuring 4 stressor groups (disproportionate customer expectations, customer verbal aggressions, ambiguous customer expectations, disliked customers), 5-point agreement scale ranging from ‘not at all true’ (1) to ‘totally true’ (5).
11	[57]	Daily incivility: Uncivil behaviour from supervisors, co-workers and customers, 20-item checklist (10 items from the Interpersonal Treatment at Work Scale and 10 items from the Uncivil Workplace Behavior Questionnaire). Reported if it was experienced on that day, either ‘yes’ or ‘no’.

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ID	Study reference	Description and measurement tool(s)
12	[58]	Daily transformational leadership: 6 items of the Transformational Leadership Inventory, includes 6 facets: Identifying and articulating a vision, providing an appropriate model, fostering the acceptance of group goals, high performance expectations, providing individualized support, intellectual stimulation. Scale ranging from ‘I strongly disagree’ (1) to ‘I strongly agree’ (5).
12	[58]	Daily team cooperation: 1 item, scale ranging from ‘I strongly disagree’ (1) to ‘I strongly agree’ (5).
12	[58]	Type of communication with supervisor: 2 items, if direct and/or indirect communication occurred on that day.
13	[59]	Daily non-sanctioned political influence tactics: Intimidation, manipulation, blaming or attacking others, Non-Sanctioned Political Tactics Measure, 3 items, either ‘no’ (0) or ‘yes’ (1). And the daily frequency of the 3 categories.
14	[60]	Social interaction: Current or recent (within the last 10 minutes), 27 items from the DABS during every assessment. Either ‘yes’ or ‘no’. If a social interaction was acknowledged, additional 31 items from the DABS were administered (including tone and content of the interaction).
14	[60]	Social conflict: Presence and intensity, DABS, 4-point scale ranging from ‘no!!’ to ‘yes!!’. ‘No!!’ if no social interaction was reported.
15	[61]	Supervisor support: 2 items, 7-point Likert scale ranging from ‘strongly disagree’ (1) to ‘strongly agree’ (7).
15	[61]	Co-worker support: 2 items, 7-point Likert scale ranging from ‘strongly disagree’ (1) to ‘strongly agree’ (7).
15	[61]	Organisational support: 4 items, perceived Organisational Support Scale, 7-point Likert scale ranging from ‘strongly disagree’ (1) to ‘strongly agree’ (7).
18	[64]	Social stressors at work: Negative interactions with colleagues and supervisors, 10 items, 5-point Likert scale ranging from ‘strongly disagree’ (1) to ‘strongly agree’ (5).

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ID	Study reference	Description and measurement tool(s)
19	[65]	Social interactions at work: Rochester Interaction Record, number of social contacts during the interval (of personal importance or a duration of more than 10 minutes), face-to-face or electronically, interaction partner (co-worker, collaborator, supervisor, client) and rating of quality via 7-point response scale ranging from ‘very agreeable’ to ‘very disagreeable’ and from ‘very unburdening’ to ‘very burdening’ (severity of negative social interactions at work).
20	[66]	Social stressors at work: Negative interactions with colleagues and supervisors, 10 items, 5-point Likert scale ranging from ‘strongly disagree’ (1) to ‘strongly agree’ (5).
23	[69]	Verbal interaction: Average speaking length and total duration of voice activity (speaking segments).
26	[72]	Social support: 9-point Likert scale, ranging from ‘low’ (1) to ‘high’ (9).
30	[76, sub-study 2]	Social contact record: Participants described the most significant interactions (maximum 5) with a minimum duration of 10 minutes (duration of contact, with whom it occurred, rating of the content: rewarding interactions, such as companionship and intimacy, 4 elements of support: emotional, appraisal, information, instrumental, indication whether the relationship was perceived as reciprocal in regards of supporting each other).
30	[76, sub-study 3]	Social contact record: Participants described the most significant interactions (maximum 5) with a minimum duration of 10 minutes (duration of contact, with whom it occurred, rating of the content: rewarding interactions, such as companionship and intimacy, 4 elements of support: emotional, appraisal, information, instrumental, indication whether feelings of inferiority as a consequence of supporting each other were experienced: threat to self-esteem).
34	[37]	Supervisor support: National Study of Daily Experiences, 2 items, scale ranging from 1 to 7.
36	[81]	Daily laissez-faire leadership: 2 items, 5-point scale, ranging from ‘strongly disagree’ (1) to ‘strongly agree’ (5).
37	[82]	Social support: Support of clients, family and friends, and colleagues and peers, 3-item formative scale.

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ID	Study reference	Description and measurement tool(s)
Skills and discretion		
6	[53]	Daily task significance: 4 items, measured with a 7-point Likert scale ranging from ‘strongly disagree’ (1) to ‘strongly agree’ (7).
14	[60]	Decisional control: DABS, 4-point scale ranging from ‘no!!’ to ‘yes!!’.
15	[61]	Autonomy: 2 items of the Self-Determination Scale, 7-point Likert scale ranging from ‘strongly disagree’ (1) to ‘strongly agree’ (7).
18	[64]	Control: (autonomy and skills development), 1 question, how far it can be applied to the characteristics of the task performed at the moment of measurement. Wide screen visual analogue scale ranging from ‘0’ to ‘10’ (to evaluate intensity).
20	[66]	Daily illegitimate tasks: 8 items of the Bern Illegitimate Tasks Scale, 5-point Likert scale ranging from ‘very rarely/never’ (1) to ‘very often’ (5).
26	[72]	Control: 9-point Likert scale, ranging from ‘low’ (1) to ‘high’ (9).
33	[79]	Control: 3 items, scores ranging from ‘0’ to ‘1’.
37	[82]	Work control: Timing control and method control, 7-item reflective scale.
39	[84]	Self-concordant motivation: Identified and integrated motivation. Likert-type scale, ranging from ‘not at all for this reason’ (0) to ‘completely for this reason’ (10).
40	[85]	Situational control: 1 item, ranging from ‘very small’ (1) to ‘very large’ (6).
Prospects		
18	[64]	Reward: 1 question, how far it can be applied to the characteristics of the task performed at the moment of measurement. Wide screen visual analogue scale ranging from ‘0’ to ‘10’ (to evaluate intensity).
24	[70]	General workplace uncertainty: 4-item scale ranging from ‘strongly disagree’ (1) to ‘strongly agree’ (5).
33	[79]	Reward: 3 items, scores ranging from ‘0’ to ‘1’.

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ID	Study reference	Description and measurement tool(s)
Commuting from and to the workplace		
6	[53]	Morning commuting stressors: Checklist (created through a focus group) with 25 possible stressful events. Either ‘this event happened this morning’ or ‘this event did not happen this morning’.
35	[80]	Stressful delays during commuting: If they experienced any form of delay or traffic congestion during the commute home, either ‘no’ (0) or ‘yes’ (1), if ‘yes’, they rated the stressfulness with 3 items, 5-point scale ranging from ‘totally disagree’ (1) to ‘totally agree’ (5).
35	[80]	Commuting time: Time (in minutes) they spent commuting by car, public transport, bike or walk, other means.
35	[80]	Recovery experiences during the commuting: Recovery Experience Questionnaire (detachment, relaxation, mastery), 4 items each, 5-point Likert scale ‘strongly disagree’ (1) to ‘strongly agree’ (5).
Occupation-specific (medicine and health care)		
17	[63]	Ambulance alarms: Recorded in journals.
21	[67]	Clinical workload: Patient load, admission volume, familiarity with patients, type of call day, continuity clinic attendance, etc., reported by a series of survey questions.
27	[73]	Number of emergency calls: Number of calls occurring during the previous 24 hours. Emergency Call Questionnaire (ECQ), ECQ number (number of calls).
28	[74]	Clinical workload: Number of patients assigned, nurse’s rating of familiarity with the patient on a scale ranging from ‘0’ to ‘9’ (higher rating representing greater familiarity), facility (adult or paediatric), setting (intensive care unit or acute care), work schedule (average length of workday), clinical experience (number of months on the unit), work activities/type of work (direct care, indirect care, administrative, education, personal, other).
38	[83]	Clinical workload: System workload metrics (via emergency department information system), patient quantity and patient complexity (chief complaint, patient wait time, patient length of stay, patient acuity at triage, managing physician, number of patients in the waiting room, ED occupancy, diversion status, average wait times, length of stay for all patients).

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ID	Study reference	Description and measurement tool(s)
38	[83]	Clinical workload: Observational task analysis (by trained observer), recording of type and duration of predefined primary clinical tasks, work interruptions.
		Various
1	[48]	Daily hassles: Hassles occurring during a shift and hassles affecting participants on a shift. Open-response format. Time was recorded. Perceived intensity of daily hassles was measured with a scale ranging from ‘not stressful’ (0) to ‘very stressful’ (4).
7	[54, 76, sub-study 1]	Stressful events record: Participants described the 5 most stressful events (events which made them feel upset for 2 hours or more). Examples of police work were given.
10	[56]	Stressful situations: The most stressful situation during the working day. Open-response format.
17	[63]	Cause of current heart rate: Information of possible causes of current heart rate. Open-response format.
18	[64]	Nursing task: Work Observation Method by Activity Timing (WOMBAT) classification: direct care, medication tasks, documentation, other professional tasks, resting.
21	[67]	Description of work activities: Classified as direct patient care, indirect care, education, transit, personal. Measured via EMA.
25	[71]	Stressful situations: COMES stress monitoring system, verbal description of the episode and situational appraisals, and emotional stress reactions.
26	[72]	Daily hassles and uplifts: 24 items, 6 items per category hassles/uplifts/work/non-work incl. commuting. 3-point scale, ranging from ‘not at all’ (0), to ‘a little’ (1), to ‘a lot’ (2).
26	[72]	Menstrual symptoms: 2 symptoms, 3-point scale, ranging from ‘not at all’ (0), to ‘a little’ (1), to ‘a lot’ (2).
27	[73]	Number of stressful events: Minor stressors, whether the event occurred during the previous 24 hours. Daily Stress Inventory (DSI), DSI event (number of stressful events).
30	[76, sub-study 2]	Stressful events record: Participants described the 5 most stressful events (events which made them feel upset for 2 hours or more).

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ID	Study reference	Description and measurement tool(s)
30	[76, sub-study 3]	Stressful events record: Participants described the 5 most stressful events (events which made them feel upset for 2 hours or more).
31	[77]	Type and time of daily activities: Noted in a personal logbook.
33	[79]	Nursing work tasks: WOMBAT, 10 categories: direct patient care, indirect care, medication, documentation, professional communication, in transit, social/break, supervision, ward related and other (tasks within the preceding 10 minutes).
34	[37]	Work-related stressors: Incidence of any kind of work-related stressor on a given day (work demands, argument or disagreement, any other stressful events happening at work), either ‘no’ (0) or ‘yes’ (1).
39	[84]	Daily work activities: The two activities with which they spent the most time during the working day. Choosing from 11 work activities in a drop-down list and/or open-response format. And duration spent on these activities was noted.
40	[85]	Stressful situations/events: Content of every stressful experience (minor and major). Open-response format and items concerning the characteristics of the situation/event (similarity with previous experiences, probability of reoccurrence).
41	[86]	Daily stressors: Daily Inventory of Stressful Events, work-related stressors in the past 24 hours, work arguments, interpersonal tensions, employee or co-worker related stressors, stressors involving hotel guests, general work overloads (content, who was involved, perceived threat, severity, appraisal), either ‘no stressor that day’ (0) or ‘stressor’ (1).

1.2 Stress outcomes

Table 2: Stress outcomes and their measurement tools categorized according to the adapted stress model of Ice and James [30].

ID	Study reference	Description and measurement tool(s)
Affective response		
2	[49]	Work experiences: Pleasurable, effortful, and stressful. Ranging from ‘not at all’ (1) to ‘extremely’ (10).
3	[50]	Emotional stress: Feelings of tension, alertness, anger, sadness, fatigue, stress, unhappiness, tired, worried, upset, based on 3 items of the Diary of Ambulatory Behavioral States (DABS), 10-point Likert scale ranging from ‘low’ (0) to ‘high’ (9). Time stamp (date, hour, minute) was recorded.
4	[51]	Negative affect: 10 adjectives of the Positive and Negative Affect Scale (PANAS), at the time of survey completion.
5	[52]	Daily stress: 3 items of the Oldenburg Burnout Inventory, measures feeling of emptiness, over-work, and physical exhaustion.
7	[54, 76, sub-study 1]	Daily negative affect: 11-item scale measuring the frequency of emotions (irritated, depressed, confused, nervous), 5-point scale ranging from ‘not’ (1) to ‘to a very large extent’ (5).
9	[55]	Negative affect: 6 items (distressed, upset, irritable, nervous, jittery, afraid) of the PANAS, 5-point agreement scale ranging from ‘not at all’ (1) to ‘totally’ (5).
11	[57]	Daily stress: 7-item stress subscale (of the short version from the Depression Anxiety Stress Scale), measures distress, tension, irritability, self-reported tendency to overreact to stressful events.
12	[58]	Daily stress: 3 items from the Irritation Scale, scale ranging from ‘I strongly disagree’ (1) to ‘I strongly agree’ (5).
13	[59]	Daily negative affect activation: Negative Affect Scale (shortened version), scale ranging from ‘not at all’ (1) to ‘very much’ (5).
14	[60]	Emotional activation: Negative affect and arousal, DABS, 4-point scale ranging from ‘no!!’ to ‘yes!!’.
15	[61]	Emotional exhaustion: Ranging from ‘never’ (0) to ‘almost always’ (6). Over the past 3 days.
18	[64]	Hedonic tone: 1-item visual analogue scale of 5 points ranging from ‘happy face’ to ‘sad face’.

Table 2: Stress outcomes and their measurement tools categorized according to the adapted stress model of Ice and James [30].

ID	Study reference	Description and measurement tool(s)
18	[64]	Fatigue: 1-item visual analogue scale of 5 points ranging from ‘full battery’ to ‘empty battery’.
19	[65]	High-arousal negative affect: Mohr Irritation Scale, measures ‘angry’ and ‘irritated’.
19	[65]	Low-arousal negative affect: Multi-dimensional Affect Questionnaire, measures e.g., ‘bad’ and fatigue dimension, measures e.g., ‘weary’.
20	[66]	State negative affect: 12 items of the PANAS Expanded Form (PANAS-X) scale, 5-point scale ranging from ‘strongly disagree’ (1) to ‘strongly agree’ (5).
21	[67]	Emotional stress: 10-questions (unhappy, tired, tense, alert, worried, stressed, etc.) from the DABS, 10-point Likert-like scale ranging from ‘0’ to ‘9’ (higher numbers indicating worse stress). (Measured via EMA)
22	[68]	Satisfaction of the employee with his/her performance: Regarding work, 1 item, 5-point Likert scale ranging from ‘strongly disagree’ (1) to ‘strongly agree’ (5).
22	[68]	Emotional Irritation: Regarding work, 7-point Likert scale ranging from ‘strongly disagree’ (1) to ‘strongly agree’ (7).
23	[69]	Stress level: 1 question (‘What is your stress level?’).
23	[69]	Negative affect: Profile of Mood States Scale (POMS), angry, tense, anxious, sad. 5-point scale ranging from ‘very slightly or not at all’ (1) to ‘extremely’ (5).
23	[69]	Positive affect: POMS, friendly, effective, energetic, cheerful. 5-point scale ranging from ‘very slightly or not at all’ (1) to ‘extremely’ (5).
24	[70]	Stress: 4-item scale ranging from ‘strongly disagree’ (1) to ‘strongly agree’ (5).
24	[70]	Job dissatisfaction: 5 items of the Job Satisfaction Scale (reverse-coded), ranging from ‘strongly disagree’ (1) to ‘strongly agree’ (5).
24	[70]	Emotional exhaustion: 5-item scale ranging from ‘never’ (1) to ‘very frequently’ (5).
24	[70]	Daily negative affect: 5 items of the PANAS.
25	[71]	Momentary psychological state or functioning: 11-point scale ranging from ‘very ... (negative pole)’ (−5) to ‘very ... (positive pole)’ (+5), mood, mental functioning, physical energy, tension, and perceived level of stress.

Table 2: Stress outcomes and their measurement tools categorized according to the adapted stress model of Ice and James [30].

ID	Study reference	Description and measurement tool(s)
26	[72]	Subjective strain: 16 items, 9-point Likert scale, ranging from ‘did not feel that way at all’ (1) to ‘felt that way very much (9)’.
27	[73]	Perceived stressfulness: Rating each event, 7-point Likert-type scale ranging from ‘occurred but was not stressful’ (1) to ‘caused me to panic’ (7). Daily Stress Inventory (DSI), DSI impact (sum of perceived stressfulness).
27	[73]	Stressfulness: Rating each call, 7-point Likert-type scale ranging from ‘occurred but was not stressful’ (1) to ‘caused me to panic’ (7). Emergency Call Questionnaire (ECQ), ECQ impact (sum of stressfulness).
28	[74]	Stress: 10-item questionnaire, different emotional activation states, anger, worry, tension, alert, fatigue, unhappy, tired, upset, sad, stress, 10-point Likert scale ranging from ‘low’ (0) to ‘high’ (9).
29	[75]	Emotional irritation: During the day, 8 items, 7-point Likert scale ranging from ‘strongly disagree’ (1) to ‘strongly agree’ (7).
30	[76, sub-study 2]	Daily negative affect: Questionnaire assessing the presence of negative feelings.
30	[76, sub-study 3]	Daily negative affect: Questionnaire assessing the presence of negative feelings.
31	[77]	Stress: Short version of State Trait Anxiety Inventory (STAI), measures emotional, cognitive, physical stress, 6 items, 4-point scale ranging from ‘not at all’ to ‘very much’.
33	[79]	Mood/experienced stress: University of Wales Institute of Science and Technology Mood Scale (UWIST), experienced stress, affect, fatigue. Visual analogue scales ranging from ‘no’ (0) to ‘yes’ (100).
34	[37]	Negative affect: 10 items (scared, afraid, upset, distressed, jittery, nervous, ashamed, guilty, irritable, hostile) for negative affect of the PANAS, responses ranging from ‘none of the time’ (1) to ‘all of the time’ (5).
35	[80]	Anxiety: PANAS-X, 6 items, 5-point Likert scale ‘not at all’ (1) to ‘extremely’ (5).
35	[80]	Serenity: Serenity subscale of the PANAS-X, 5-point Likert scale ranging from ‘not at all’ (1) to ‘extremely’ (5).
36	[81]	Daily stress: 2 items, 5-point scale, ranging from ‘strongly disagree’ (1) to ‘strongly agree’ (5).

Table 2: Stress outcomes and their measurement tools categorized according to the adapted stress model of Ice and James [30].

ID	Study reference	Description and measurement tool(s)
37	[82]	Well-being: 2 items about calmness (anxious vs. calm) and 2 items about enthusiasm (gloomy/depressed vs. enthusiastic), 5-point response scale ranging from ‘not at all’ (1) to ‘a great deal’ (5). Responses for anxious and gloomy/depressed were reverse-coded.
39	[84]	Happiness: 1 item, scale ranging from ‘not happy at all’ (0) to ‘very happy’ (10).
40	[85]	Stress intensity: Measured on a 6-point Likert scale ranging from ‘very low’ (1) to ‘very high’ (6).
41	[86]	Negative affect: PANAS measuring distressed, upset, guilty, scared, hostile, irritable, ashamed, nervous, jittery, afraid. 5-point scale ranging from ‘very slightly/not at all’ (0) to ‘extremely’ (4).
Appraisal		
1	[48]	Perceptions of patient safety: Measured in relation to ‘this shift’ with the Hospital Survey on Patient Safety Culture (HSOPC). 4 items, 5-point scale ranging from ‘strongly disagree’ (1) to ‘strongly agree’ (5).
1	[48]	Safe practitioner measure: Measured in relation to ‘this shift’. 1 item, 5-point scale ranging from ‘strongly disagree’ (1) to ‘strongly agree’ (5).
6	[53]	Morning commuting strain: 8 adjectives from the Stress in General Scale to describe their feelings during commuting with a 5-point Likert scale ranging from ‘strongly disagree’ (1) to ‘strongly agree’ (5).
10	[56]	Stress intensity: Indicating how much stress was experienced during the stressful situation, 5-point Likert-type scale ranging from ‘low’ (1) to ‘high’ (5).
13	[59]	Daily threat appraisal: Threat, hindrance, obstruction, 3 items, 5-point scale ranging from ‘strongly disagree’ (1) to ‘strongly agree’ (5).
Behavioural response		
5	[52]	Daily job performance: 3 items of the Tarafdar, Tu, Ragu-Nathan, and Ragu-Nathan Productivity Questionnaire.
6	[53]	Self-regulation during morning work: 12 items, measured with a 5-point Likert scale.

Table 2: Stress outcomes and their measurement tools categorized according to the adapted stress model of Ice and James [30].

ID	Study reference	Description and measurement tool(s)
24	[70]	Counterproductive work behavior: 6 items of the Counterproductive Work Behavior toward the Supervisor Scale, ranging from ‘strongly disagree’ (1) to ‘strongly agree’ (5).
26	[72]	Job performance: 3 items, 9-point Likert scale, ranging from ‘not very’ (1) to ‘very’ (9).
Cognitive outcome		
1	[48]	Workplace cognitive failure: Measured in relation to ‘this shift’ with the Workplace Cognitive Failure Scale (WCFS). 15 items, 5-point scale ranging from ‘never’ (0) to ‘very often’ (4).
20	[66]	Lack of psychological detachment from work: 4-item scale, 5-point scale ranging from ‘strongly disagree’ (1) to ‘strongly agree’ (5). Measured shortly before going to bed.
22	[68]	Forgetting of intentions: Regarding work, 1 item, either ‘no’ (0) or ‘yes’ (1).
22	[68]	Cognitive Irritation: Regarding work, 7-point Likert scale ranging from ‘strongly disagree’ (1) to ‘strongly agree’ (7).
29	[75]	Cognitive irritation: During the day, 8 items, 7-point Likert scale ranging from ‘strongly disagree’ (1) to ‘strongly agree’ (7).
Health outcome		
26	[72]	Psychosomatic symptoms: 15 items, 3-point scale, ranging from ‘not at all’ (0), to ‘a little’ (1), to ‘a lot’ (2).
41	[86]	Health symptoms: Symptom checklist measuring aches, gastrointestinal symptoms, upper respiratory symptoms. Indicating if they had each symptom, either ‘no’ (0) or ‘yes’ (1) and their severity ranging from ‘very mild’ (1) to ‘very severe’ (10).
Motivational response		
11	[57]	Work engagement: 9 items (shortened Utrecht Work Engagement Scale), includes 3 aspects: Vigour, dedication, absorption. 5-point Likert-type scale ranging from ‘strongly disagree’ (1) to ‘strongly agree’ (5).
15	[61]	Work engagement: Ranging from ‘never’ (0) to ‘almost always’ (6). Over the past 3 days.
16	[62]	Work engagement: 9 items of the Utrecht Work Engagement Scale, 7-point scale ranging from ‘totally disagree’ (1) to ‘totally agree’ (7).

Table 2: Stress outcomes and their measurement tools categorized according to the adapted stress model of Ice and James [30].

ID	Study reference	Description and measurement tool(s)
29	[75]	Work engagement: 9 items of the Utrecht Work Engagement Scale, 7-point Likert scale ranging from ‘totally disagree’ (1) to ‘strongly agree’ (5).
Physiological response		
8	[36]	Heart rate variability: Continuously from Monday morning until Saturday morning (whole study period).
14	[60]	Systolic blood pressure: Every 45 minutes, during waking hours.
14	[60]	Diastolic blood pressure: Every 45 minutes, during waking hours.
14	[60]	Heart rate: Every 45 minutes, during waking hours.
17	[63]	Heart rate: Every 15 seconds, at work and at home; 24 hours a day.
19	[65]	Salivary cortisol: Before and after work.
31	[77]	Heart rate variability: During all daily work activities.
31	[77]	Stress percentage: Displayed every 4 seconds, stress level ranging from ‘lowest’ (0) to ‘highest’ (100), no measurement during physical activity.
32	[78]	Systolic blood pressure: Every 20 minutes.
32	[78]	Diastolic blood pressure: Every 20 minutes.
32	[78]	Heart rate: Every 20 minutes.
33	[79]	Heart rate: Every 15 seconds, continuously over 2 shifts.
34	[37]	Salivary cortisol: 5 samples throughout the day.
38	[83]	Galvanic skin response: Measuring workload, minute-by-minute measurement, during the observation period.

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