

Work-related conditions and protective factors affecting exhaustion during the Corona Pandemic

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Abstract

The psychosocial work-environment's effect on exhaustion is an increasingly important area. Causes and effects on the individual and the organization are important to identify. This study examines what is creating and what is preventing exhaustion. Participants consisted of 310 working individuals (59% women, 46% leaders). The results indicate an unusual high level of exhaustion where a quarter of the participants were above the threshold for exhaustion disorder. The Pandemic has changed the work environment in terms of Working from Home and Digital Meetings. Work from Home and Digital meetings affected several different work-related conditions but did not directly affect the level of exhaustion. A hierarchical multiple regression analysis indicated gender (female), boundary management and information transparency as the biggest negative effects, and exercise, sleep, and emotion focused coping as the biggest protective factors. Psychoeducation, coaching, leadership, and improved ways of working are proposed interventions to deal with work related exhaustion.

Background

The outbreak of the Corona virus early 2020, changed both life and the work environment for many. Working from home was recommended by the authorities and social interactions were radically decreased. Some businesses were severely affected by the crisis in terms of sales, while others were mostly affected in terms of working procedures. These are factors potentially leading to increased stress reactions. Is this a health problem in a wider perspective than the virus itself?

The World Health Organization's (WHO, 2015) definition of health is "a state of complete physical, mental and social well-being, and not merely the absence of disease and infirmity." Good health and well-being is also one of the 17 UN sustainable development goals – agenda 2030.

As part of mental and physical well-being, stress has been identified as an important area, not the least in the psychosocial work environment. The cost for the society, industry and the individual is substantial, both in productivity loss, sick-leaves, and personal suffering. According to Mattias Lundbäck, economist at Svenskt Näringsliv, the total cost for psychological ill-health is already almost 80 billion SEK per year in Sweden, including governmental sick pay and production loss due to absence (Vanhainen, 2018).

Psychiatric illness has become a major cause for long-term illness in Sweden and other parts of Western society. The leading cause for sick leaves in Sweden falls under the category "reaction to severe stress, and adjustment disorder".

From 2011 to 2016, the number of individuals on sick leave for mental disorders more than doubled in Sweden. In 2016, 89.000 people were on sick leave due to some kind of mental strain (Försäkringskassan, 2017). The curve then remained fairly stable, and in December 2019, mental disorders accounted for 53% of all sick leave cases for women and 42% for men. In the age span of 19-49 years, mental disorders accounted for more than 60% of all sick leave cases. Mental disorders were the most common diagnosis category in all age groups except for men aged 60 and over. In 2019, mental disorders accounted for 88% of all newly granted activity compensation, i.e financial security in the event of long-term reduction in

work capacity. For sickness compensation, mental disorders accounted for 46% of newly granted cases.

During the pandemic, the number of sick days per worker, all causes, increased on a quarterly comparison between 2019 and 2020, women generally having a higher average of sick days than men. The average amount of sick days the fourth quarter 2019 was 1.36 for men and 2 for women. For the corresponding quarter 2020 the number had increased to 1.91 for men and 2.88 for women (Statista Research Department, 2021). This is likely to include an increase in sick leave also due to mental disorders. According to figures from Statista, the numbers continued to increase slightly between the third quarter of 2020 and 2021 in the business sector (Statista Research Department, 2021). For women with .13 days and for men with .08 days. In what way the Corona pandemic affected those numbers is unclear as well as the distribution based on Covid, taking care of sick children and leave due to exhaustion and mental disorders.

We need to know more about both causes and effects to create better preventive methods and decrease the cost associated both from a societal perspective and human suffering.

Stress is a wide concept and where the word stress tends to be used to describe the perceived situation as well as what is causing it and the full physiological, cognitive, emotional, and behavioral response. There are good reasons to differentiate those for a better understanding and more distinct discussions.

This paper will focus on the *stress response*, the effects on body and brain, when exposed to *stressors* considered threatful to the human system. The stress response will be examined through self-evaluation of exhaustion and different work-related conditions will be examined in terms of how common they are and if they are potential stressors. The perception if a certain work-related condition is stressful is not examined, merely how much of it exists. Through statistical analysis we will then be able to identify the associations with exhaustion.

The level of exhaustion is also affected by individual differences in how to deal with stressors. This is often called resilience and described as the ability to bounce back from difficulties. For this paper, resilience will be measured through the individual usage of coping strategies and protective health factors such as sleep, exercise, and mindfulness practice.

The purpose of the paper is to look further into work-related conditions and protective factors affecting exhaustion. The context is, due to timing, the Corona Pandemic. The paper investigates factors that may add to exhaustion, but also from the opposite angle – factors that may prevent exhaustion. Are there any learnings that can help more people thrive through changes and crisis, independently of type of crisis?

Working from home has increased due to recommendations from authorities and it is interesting to see how that affects both different work-related conditions and the overall level of exhaustion. This is valuable knowledge in knowing how to deal with the new normal and hybrid working when all restrictions are gone.

Theoretical Framework

Stress Response – the cause of exhaustion

Allostasis - the physical response

The stress response is the physiological response to restore or prepare to restore *homeostasis*, where homeostasis is the body's internal physical, and chemical state for optimal functioning and survival. This includes body temperature, fluid balance, blood sugar levels and concentrations of sodium, potassium, and calcium ions in the body and brain (McEwan 2016).

The response, *allostasis*, is the process of maintaining homeostasis through adaptive change in the body and brain. Allostasis respond to physical and psychological influence and threat, where threats can be crowding, isolation, hunger, extremes of temperature, physical and psychological danger, psychosocial stressors, and microbial or parasitic infections (McEwan 2016).

Developed through millions of years and shared with many other species, the basic responses to threatful situations are fight or flight. From a physiological perspective, this means that the body is preparing for physical action where e.g., muscles need fast energy and oxygen. Important to notice is that the same system kicks in even if the threat is not physical, but more of a psychological or social nature. Sort of a glitch in the evolutionary system.

The sympathetic part of the autonomous nervous system kicks in instantly. This is also called the *SAM-axis*, sympathetic-adreno-medullar axis. The medulla releases adrenaline, noradrenaline, and dopamine into the blood stream which increases heart rate and blood pressure as well as breathing and oxygen uptake. The adrenaline also triggers the release of glucose/blood sugar from temporary storage sites such as adipose tissue, or in simpler terms body fat (Burrage et al, 2018).

The sympathetic nervous system also activates amygdala in the brain and triggers the second stress axis, the *HPA-axis*, hypothalamic-pituitary-adrenal axis. (Arnetz & Ekman, 2013). The HPA-axis, via the adrenal cortex, releases cortisol into the blood stream. Cortisol secures both access and efficient usage of energy by increasing the levels of insulin. The increased level of insulin will open the cells for extra energy in terms of blood sugar and blood lipids, cholesterol (Gu et al, 2012 according to Pienaar, 2019).

The circulating cortisol permits coordination between the brain and body functions that are geared toward coping, recovering, and adapting to the stressful stimulus. Cortisol also plays a key role in regulating the stress response by providing inhibitory feedback to the HPA axis, thereby terminating the stress response once the stressor has subsided (Gu et al, 2012 according to Pienaar 2019).

At the same time as the SAM- and HPA-axis are up-regulated, neurovegetative functions such as sleeping, and digestion are down-regulated (Burrage et al, 2018).

Allostatic load refers to the cumulative burden of chronic stress and life events, i.e., a prolonged or subsequent stress response that continues without time for recovery. Findings indicate that allostatic load is associated with poorer physical and mental health over time. People who consider their life more stressful are at higher risk of high blood pressure and atherosclerosis. Two conditions well known as pathophysiological determinants of heart disease (Gianaros & Wager, 2015; Guidi et al, 2021).

All these physiological effects can be measured through different types of medical testing, but they are also present as noticeable cognitive and physical effects possible to measure through

self-evaluation surveys (Besèr et al, 2013). For the purpose of this paper, exhaustion will be equaled to allostatic load.

Exhaustion Disorder – the diagnosis

The Swedish National Board of Health and Welfare (NBHW), adopted in 2005 the diagnostic criteria Exhaustion Disorder (ED) with the ICD code F43.8 for diagnostic purposes (ICD, 2015). Exhaustion Disorder is not yet a separate diagnosis in DSM-5.

ED is a diagnosis based on the physiological and psychological effects of allostatic load i.e., the prolonged response to environmental stressors, major life events and trauma/abuse.

The diagnosis requires physical and mental symptoms of exhaustion during at least two weeks, and that the symptoms have developed in response to one or more identifiable stressor present for at least six months. The clinical picture is dominated by substantially reduced mental energy, manifested by reduced initiative, lack of endurance, or increased need for recovery after mental effort. For a diagnosis, the symptoms shall also cause clinically significant distress or functional impairment in occupational, social, or other important respects (NBHW).

ED is slightly different from burnout that includes cynicism and reduced professional accomplishment. Burnout and its measurements are usually related to strictly professional working settings, while ED opens for a broader cause and effect of the symptoms. Most of the variance in ED have not been able to explain by burnout, as assessed with the Shirom Melamed Burnout Questionnaire (Persson et al, 2017; Saboonchi et al, 2012).

According to Besèr et al. (2013), ED is characterized by prolonged fatigue, cognitive problems, poor sleep, and reduced tolerance to further stress and may cause long-term disability, anxiety, and depression. Epidemiological data suggest that ED usually remains over a longer period. Half of public health workers in Sweden with a sick leave due to ED of 30 days or more are still on sick leave after one year (NBHW, 2013).

Karolinska Exhaustion Disorder Scale (KEDS) – the test

A diagnostic measurement tool, Karolinska Exhaustion Disorder Scale (KEDS), has been constructed by Besèr et al. KEDS consists of 9 areas - Concentration, Memory, Physical stamina, Mental stamina, Recovery, Sleep, Hypersensitivity to sensory impressions, Experience of demands, Irritation and anger. Table 1 describes the different stress reactions included in KEDS.

The KEDS score is based on the sum of the 9 areas which creates a 0-54 result with a proposed cut-off score of 19 between healthy individuals and individuals with ED. This cut-off score has shown both sensitivity and specificity above 95% (Besèr et al, 2013). Based on a study with 1355 individuals, the general population is estimated to include around 13% that score 19 or higher. (Saboonchi et al, 2012). A mean of 8 for healthy individuals and 30 for people with diagnosed ED was shown in a study including 200 patients with diagnosed ED and 117 healthy individuals (Besèr et al, 2013).

Binary logistic regression analysis has confirmed that KEDS scores have a positive association with the odds of being an ED patient (Besèr et al, 2013).

Table1. Description of stress reactions according to KEDS

Stress Reaction	Description
Ability to Concentrate	Keep thoughts together and concentrate on various activities. Being able to function in various activities that demand different levels of concentration, e.g., reading a complicated text, reading a newspaper article, and watching TV.
Memory	Ability to remember things. For example, having difficulties recalling names, dates, or tasks that was intended to be done during a regular day.
Physical Stamina	Feeling more physically exhausted than usual after the activities of an ordinary day or after some form of physical exertion.
Mental Stamina	Being more mentally exhausted than usual in various everyday situations.
Recovery	The speed of mental and physical recovery after being exhausted.
Sleep	The length and quality of sleep. Reflecting the actual sleep, regardless of whether sleeping pills have been taken or not.
Hypersensitivity to Sensory Impressions	The sensitivity of the senses to impressions, such as sound, light, smell, or touch.
Experience of Demands	The reaction to demands in daily life. These demands can come from the surroundings or be internal demands on self.
Irritation and Anger	The ease of becoming irritated or angry regardless of whether it is shown or not. The speed, frequency, and intensity in relation to the source of irritation.

Please see appendix 1 for a description of the different levels for each of the 9 KEDS areas used in the test.

Effects on brain and body – exhaustion explained

The allostatic load, or exhaustion, affects the body as well as several brain regions. This negatively affects cognitive as well as physical abilities and explains why ED manifest itself with the subjectively recognizable KEDS areas and can be measured with self-evaluation tests.

The ability to *concentrate* relies on the Prefrontal Cortex. The prefrontal cortex (PFC) is the most evolved brain region and contains our highest-order cognitive abilities. However, it is also the brain region that is most sensitive to the negative effects of stress exposure. Stress impairs higher-order PFC abilities such as working memory and attention regulation (Arnsten, 2009). Dysfunctions in working memory has been indicated in several Event Related Potential (ERP) studies, and Mendelian Randomization (MR) studies have indicated regional neural reduction in PFC for individuals with work-related stress (Sokka et al, 2016; Blix et al., 2013).

The Hippocampus, which is a brain structure important for learning and *memory*, has high levels of adrenal steroid receptors and is therefore sensitive to the effects of stress (McEwan, 2005). Hippocampus is an important structure for learning and memory consolidation. Animal based research shows that chronic stress decreases the volume of hippocampus, and in humans with stress-related symptoms, a smaller hippocampal volume has been detected compared to control groups (Gianaros et.al, 2015). The causal effect is however more difficult to establish with humans than with mice. Chronic stress also disrupts the connectivity and

plastic relationship between the PFC and the hippocampus that is needed for flexible memory consolidation (Arnsten, 2009). On the bright side, based on findings from animal models of stress and trauma, the remodeling of the hippocampus in response to stress may be largely reversible (McEwan, 2005).

Long term stress' effect on *physical stamina* is related to the heightened level of cortisol over a long period, which disrupts blood sugar, blood lipids and the insulin balance. This effects the optimal distribution of energy to the muscles (Sjörs et al, 2013). The negative effect of stress on blood vessels in terms of atherosclerosis will also reduce the ability to support the muscles with adequate amounts of oxygen and blood sugar.

The *mental stamina* is also affected by long term stress. Under conditions of psychological stress, the amygdala activates stress pathways in the hypothalamus and brainstem, which impairs PFC regulation and strengthens amygdala function. High levels of these catecholamines strengthen fear conditioning mediated by the amygdala (Arnsten, 2009). A Positron Emission Tomography (PET) study from 2011 showed that participants with chronic work-related stress displayed dysfunctions in limbic networks, more specifically a functional disconnection between the amygdala and anterior cingulate/medial prefrontal cortex, suggesting an impaired top-down regulation of stress stimuli (Jovanovic et al, 2011). The PFC loses the ability to “calm down” the amygdala and the alert system is always on.

Long term stress has also shown to be related to insufficient *recovery* from work stress (Guidi et al., 2021). This is partly tied to the prolonged effect of cortisol disturbing the feedback loop aimed at inhibiting further stress response, which leaves a vicious cycle of continuous high levels of cortisol and no ability to recover.

The body can deal with high levels of stress if it gets a chance to rest and recover. The brain needs *sleep* to recover and heal itself. High stress levels tend to bring rumination and anxiety which keeps the brain awake when it should be resting. This becomes a negative spiral where stress leads to bad sleep and bad sleep increases the stress level.

Hypersensitivity to sensory impressions is measured in KEDS as a parameter of stress. This is explained by the impaired PFC having a limited ability to sift out unimportant and disturbing sensory input creating a cacophony of input (Arnsten, 2009).

Stress present over an extended period of time will manifest itself in a feeling of being overwhelmed by *demands* impossible to manage. The effect of stress on the PFC will create a reduced capacity for higher cognitive functions as focusing and solving problems, this will make normal tasks and demands too much to deal with. What was possible to manage before will now become overwhelming (Arnsten, 2009).

The effect on the PFC will also affect the impulse control and regulation of the amygdala and intense emotions. The perceived increase of *irritation and anger* is a result of the Amygdala hijacking the situation leaving no room for perspective taking and self-control (Jovanovic et al, 2011).

Stressors – the road to exhaustion

Stressors are events or situations that by the brain is perceived as potential threats to the human physical, mental or social safety (McEwan 2017). Exposure to frequent stressors may create a status of chronic stress (allostatic load) and repeated physical arousal. A lack of adaptation to repeated stressors or the inability to shut off the stress response after the stressor itself is terminated will worsen the allostatic load (Guidi et al, 2021). For the purpose of this study stressors are considered creating exhaustion.

Having too much to do is often used as a description for stress and can certainly be a stressor by itself. It is however worth noticing that being at a high exhaustion level will lower the cognitive ability which will create the *perception* of having too much to do since the brain is working less effectively. It is therefore important to look at other factors as stressors.

Stressors will include obvious parts as deficiency of food and water. Threats from nature in terms of cold, heat and natural disasters are also on the list. The list will also include dangerous animals, enemies, poisons, and diseases. On top of this, humans are evolutionary a physically fragile, ill-equipped specie for surviving in solitary. The need for social support and being part of a group is therefore essential, which makes any threat to the social structure a potential stressor (Arnetz & Ekman, 2013).

M.A.S.T.E.R. – social factors affecting exhaustion

Based on social cognitive neuroscience theories, the components of threat and reward can be described through several social factors. Psychological health has been connected to control, social support, perceived fairness, development, and rewards (Sverke et.al, 2016).

From a model perspective there are several different models, all with the same basis. For this paper M.A.S.T.E.R will be used – Meaning, Autonomy, Status, Truth, Equality and Relations. M.A.S.T.E.R is a model developed by the author in 2018 for professional work with management teams and organizations. The areas are described in table 2.

M.A.S.T.E.R is referring to the positive and rewarding aspect for the social brain. When they are missing, restricted or violated the brain will react with a stress response.

Table 2. Description of social factors and their stressors

Social factor	Description	Stressor
Meaning	The innate need for a purpose and an understanding of why we are doing things.	Lack of purpose
Autonomy	Exerting control and being able to influence the situation. The sense of having choices.	Limited freedom and choice
Status	The relative importance in relation to others. The need to be important, to matter.	Being nobody
Truth	The need for certainty. When things are predictable the brain can work on autopilot which is an energy saving way of operation.	Uncertainty, disinformation and lies
Equality	The social need for things to be fair and just. The feeling of being treated as equal and that others are to.	Unfairness and unequal treatment
Relations	Belonging to a group where trust is fundamental, and safety is cared for.	Isolation and alienation

Meaning – lack of purpose

The brain is a meaning and prediction-making machine with high focus on detecting and creating patterns that match (Kahneman, 2011; Lieberman et al, 2002). Research has shown that less purpose in life have predicted higher level of allostatic load over a ten-year period of time (Guidi et al, 2021). A metanalysis from 2016 (Sverke et al.) indicates a clear connection between unclear goals and mental health problems in the work environment.

Meaning can be violated in many ways and in different contexts. In the work context this is normally seen through unclarity in why things are done the way they are, and why they are important. A missing focus on what is truly important. A lack of clear and common goals that are challenging but doable. A sense of meaningless in relation to the effort given.

Autonomy – limited freedom and choice

Research shows that the feeling of being able to influence the situation and that choices can be made means less perceived pain and that bigger challenges are accepted (Leotti et al, 2010). Research also shows that groups with less degrees of control and autonomy are less healthy and live shorter in nursing homes (Thompson, 1981). Several studies from work environments have also shown an association between low control and mental health problems (Sverke et.al, 2016).

When the ability to influence one's work and participate in decision making is limited, autonomy is violated. Extensive routinization, repetitive work, and close supervision together with limited job content and lack of responsibility will negatively affect autonomy (Sverke et al, 2016). A lack of guidance and unlimited options without clear criteria for making a choice is also considered stressful.

Status – being nobody

Low status has shown to create higher baseline levels of cortisol, meaning higher levels of stress, and subsequently decreased health and longevity (Marmot, 2006). This has been labelled as the Status Syndrome. Several studies support the idea that low status, especially low socioeconomic status, increases stress levels and negatively affects health (Guidi, 2021).

Lack of opportunity for development and no rewards connected to work has in several studies been associated with mental health problems (Sverke et al., 2016). Salary, bonuses, and other benefits will also affect the sense of status in the workplace. Not getting credit for thoughts, ideas and work done will be stressful (Rock, 2008). Limited career possibilities or no opportunities for development of new skills and abilities will negatively affect status (Sverke et al., 2016).

Truth – uncertainty, disinformation and lies

The brain will fight to avoid uncertainty and seek certainty wherever possible, to protect itself from unnecessary energy consumption (Lieberman et al, 2002). Knowledge and having relevant information are not only prerequisites to perform different task but will also create a sense of inclusion and feeling of importance.

Unclear or lack of information about the future and the present situation will negatively affect truth. Suspicions about hidden agendas and a feeling of being kept in the dark is stressful. Lies are also stressors, detected as well as believed. Not receiving relevant feedback on performance and required behaviors creates insecurity, and insufficient role content and expectations builds uncertainty (Sverke et al, 2016).

Equality – unfairness and unequal treatment

Humans have a well-developed feeling and social need for justice, and equality (Rock, 2008). Justice, equality, and fairness are strong social driving forces. Perceived unfairness in the workplace have in several studies been associated with mental health problems (Sverke et al., 2016).

In the work environment, unfair treatment from higher management, peers and subordinates is stressful. Unfair treatment of others will also negatively affect us. Discrimination due to age, sex, race, or any types of believes creates a toxic environment.

Relations – isolation and alienation

Relations is an old evolutionary need where the safety of the clan was crucial for getting the food and shelter required for survival (Harari, 2012). Social relations and interpersonal contacts include both the quantity and quality of interactions.

Several studies have shown an extensive pain response when feeling excluded. The social pain reaction has shown to be intense both from a self-evaluation perspective and from fMRI scans (Hartgerink, et al, 2015). A broad range of studies in the workplace have shown a connection between interpersonal conflicts and mental health problems as well as missing social support and mental health problems (Sverke et al., 2016).

The lack of emotional and instrumental support from higher management, peers and subordinates undermines good relations and security. No time and place for social and informal contacts including chit-chat makes friendship harder to develop (Sverke et al, 2016).

Work-related conditions – affecting M.A.S.T.E.R

The association between work-related stressors and mental health problems is well established (NHBW, 2013). Clinical studies show that working conditions is a central and triggering factor in around half of sick leaves diagnosed as reaction to severe stress, and adjustment disorder. Allostatic load, exhaustion, has shown to be related to e.g., job demands, reorganizations and effort-reward imbalance (Guidi et al, 2021). It is, however, also clear that exhaustion is not only connected to work but is based on the total life situation and priorities between work and other parts of life.

For the purpose of this paper, and with an explorative attempt, a number of work-related areas challenged by the pandemic was chosen by the author based on previous theory and numerous discussions with people working in different lines of business. The choice was also based on situations affecting M.A.S.T.E.R.

The work-related areas used in this study are of course also present during normal circumstances. The work-related conditions are described in table 3.

Table 3. Description of work-related conditions and their effects on M.A.S.T.E.R

Work-related conditions	Definition	Description	Effects on M.A.S.T.E.R
Boundary Management	Work-life balance	Boundary management is the ability to create a work-life balance by separating work, family, and personal time.	Poor boundary management will negatively affect autonomy in other parts of life and may also damage social relations outside work, e.g., with family and friends.
Meeting Culture	Efficient meetings serving a purpose	Meeting culture creates a level of structure, focus and engagement in the meetings. It dictates the efficiency and how well the purpose of the meeting is served.	An inefficient meeting culture may create a sense of meaningless, loss of autonomy, lowered status, feeling of information secrecy, unfairness, and alienation. Inefficient meetings are also a waste of valuable time.

Transparency	Access to information	Transparency provides everyone with the information needed to do a good job, feel involved and stay committed.	Lack of information or the feeling to miss out on important knowledge creates uncertainties, lowered status, and alienation from the team. A lot of information is crucial to perform the job correctly.
Social Contacts	Building trust	Social contacts include small talk and the possibility to know each other better. Interacting with colleagues creates bonds that build trust.	Lack of social contacts affects the innate need for relations. It may also negatively affect flow of information (truth).
Technology	Well-functioning technical environment	Technology includes appropriate equipment, necessary training, and high-quality technical support required to perform the job efficiently and with high quality	Not being able to master the technology will lower status, reduce the autonomy of efficient working, and negatively affect relations with colleagues.

Please see appendix 2 for the specific statements used in the survey.

Boundary Management – work-life balance

Boundary Management is an important factor for optimal working conditions, especially when working from home. This requires clear expectations on working hours and support in drawing the line between work and family. Boundary management makes it possible to leave work completely and not always be “on”. (Oakman et al, 2020). Maintaining strict boundaries may be challenged by the sense of status and social belonging to the team resulting from always being available.

Clear routines of when, where, and how to work and a sound corporate culture supports a healthy Boundary Management.

Meeting Culture – efficient meetings serving a purpose

Meetings are an important part for transfer of information, problem solving, coworker cooperation and for decision making. Space between meetings is however important to create room for both reflections and to move the work forward. The brain requires small breaks to function efficiently. Parallel tasking by reading e-mails or surfing during meeting will create frequent switches of focus which is very tiring for the brain and reduces the cognitive capacity.

A good meeting culture will strengthen the sense of meaning, belonging and transparency and requires awareness, knowledge, and the ability to run efficient meetings.

Transparency – access to information

Regular communication around role expectations, clearly defined performance measures, appropriate workloads, and access to human resources support are extra important when working from home (Oakman et al., 2020).

Knowledge and understanding of work performed outside the closest team builds a better understanding of the overall purpose and creates an ability to work more autonomously and take more initiatives. Transparency will also include relevant feed-back on performance.

A high level of transparency requires a feedback culture and a surrounding team of people daring to speak their mind and wanting to give support. Transparency will also require well-established channels for sharing of information.

Social Contacts – building trust

A work situation where social contacts are not supported through regular visits to the coffee machine and quick meetings in the hallway, requires other means. In a working from home environment this includes regular face-to-face online contacts (Oakman et al, 2020).

The human species need social relations. Trust is built while connecting to other people and getting to know them. This means that trust requires time. The office small talk including updates from one's personal life as well as gossip from other parts of the organization works as social glue as well as important transformation of information. Frequent social contacts build the security net for detecting problems, stress reactions and early signs of exhaustion.

Social contacts require space and time. Time for informal chit-chat, time for meetings without a packed agenda. Space where meetings naturally take place and conversations easily happen. Spaces that can be physical or digital.

Technology – well-functioning technical environment

A well-functioning work situation requires access to important data and information as well as the possibility to easy connect with colleagues in digital meetings. Technology not working the way it should, is by itself a well-known stressor.

A well-functioning technical environment requires a support organization that is easily accessible as well as proper training to master the technical environment.

Resilience – the battle against exhaustion

Resilience is the process of adapting well in the face of adversity, trauma, tragedy, threats, or other significant sources of threat. Resilience involves behaviors, thoughts and actions that strengthens the body and mind.

According to American Psychological Association, APA, resilience is built through social connections, wellness through physical activity, sleep, nutrition, and mindfulness. It is supported by having a clear purpose, fostering healthy thoughts, and seeking help when needed.

For this paper, resilience will be described as protective factors in terms of coping strategies and protective health factors.

As described earlier, the different areas of M.A.S.T.E.R. become stressors when they are violated. Lack of meaning, autonomy, status, truth, equality, and relations are all considered threatful to the human brain. However, when they are strengthened, they will serve as reward mechanisms and build resilience. On top of this, humans have developed several coping strategies to effectively deal with stressors and subsequent exhaustion.

For the purpose of this paper resilience will be explained in the terms coping strategies and protective health factors.

Coping Strategies

Coping as defined by Lazarus and Folkman (1984) are “constantly changing cognitive and behavioral efforts to manage specific external and/or internal demands that are appraised as taxing or exceeding the resources of the person”. In other words, how individuals respond and deal with stressful situations to reduce the strain.

The initial Folkman and Lazarus work (1984) stated two types of coping, problem focused and emotion focused coping. Problem focused coping as a behavioral and cognitive effort to reduce the stress by dealing with the problem, and the emotion focused coping as managing the emotions caused by the stressor and the stress reaction.

The initial COPE inventory (Coping Orientation to Problems Experienced) created by Carver in 1989 leans on the theoretical foundation of Lazarus model of stress and the model of behavioral self-regulation. Behavioral self-regulation is the ability to manage our energy, emotions, attention, and behavior in ways that are socially acceptable and help us reach our goals.

COPE consisted initially of 60-items and was for simplicity in research reduced by Carter in 1997 into the Brief Coping Scale. The Brief COPE includes 14 different areas of coping answering the question “What do you usually do when you are stressed by a problem?” Carver also labelled some of the strategies as maladaptive coping.

Nahlén et al. (2010) made a four-factorial model consisting of Problem Focused Coping, Emotion Focused Coping, Socially Supported Coping, and Avoidant Coping. Where the Avoidant Coping relates to Carvers maladaptive coping. In creating the four-factor model, they decided to omit self-distraction and self-blaming from the Brief COPE, since these were not part of the original COPE.

Avoidant Coping - behavioral disengagement, denial, and substance use, have been associated with negative outcome in several studies (Nahlén et al. 2010, Bose et al. 2015). For example, indicating lower health-related quality of life for patients with chronic heart failure.

Venting, that originally was part of socially supported coping, has in further studies also been suspected to be maladaptive and have a negative effect since venting of emotions and the self-focused attention that implies may be related to an increase of depressive affect and emotional distress due to increased rumination and worries. (Nahlén et al., 2010).

For the simplicity of this study, a three-factor model is used looking only at the coping strategies with an expected positive and protective effect, see table 4. The focus is also to look at coping strategies that are possible to improve through psychoeducation, training, and coaching. The factor Emotion Focused Coping was therefore reduced to two areas, excluding Humor and Religion.

According to Carver (1997), using a subset of the Brief COPE is an acceptable way to narrow down the scope of the survey.

Table 4. Definition and description of Coping strategies

Coping Strategy	Definition	Description
Problem Focused	Planning	Planning is the ability to think and come up with a strategy about what to do and what steps to take to deal with the problem. Active coping is the ability to take actions to do something about the situation and make it better.
	Active Coping	
Emotion Focused	Positive Reframing	Positive reframing is the ability to see what is happening in a different light to make it more positive and looking for the good in what is happening. Acceptance is the ability to accept the fact that it is happening and learning to live with it.
	Acceptance	

Socially Supported	Informational Support	Informational Support is the ability to find help and advice from other people about what to do. Emotional Support is the ability to get emotional support in terms of comfort and understanding from someone else.
	Emotional Support	

Please see appendix 3 for coping strategies and statements used in the survey.

Problem focused coping targets the causes of stress in practical ways. Problem focused coping aims to reduce or remove the cause, the stressor, through planning and actions. It is a way to actively do something to address the problem through planning and active coping.

Emotion focused coping targets the emotional effect of stress. It consists of efforts to change or reduce negative emotions elicited by a stressor. Embarrassment, fear, anxiety, and frustration are reduced or removed through positive reframing and acceptance.

Socially supported coping includes getting help from someone else. It includes both informational and emotional support. It is a way to use further resources by involving others that may help.

According to Muhonen and Torkelson (2005), the most used coping strategies are active coping (problem focused), planning (problem focused) and emotional support (socially supported).

Protective Health Factors

Physical Activity

The WHO has recommended 150-300 minutes of moderate-intensity activity per week. This intensity is equivalent to walking in a 4-5 km per hour pace. This level of physical activity will improve several health-related outcomes including cardiovascular health, obesity, diabetes, and mental disorders.

Longitudinal clinical studies have shown a direct relationship between physical inactivity and symptoms of depression and anxiety. Physical activity has consistently shown to be associated with improved physical health, life satisfaction, cognitive functioning, and psychological well-being (Carek et al, 2011).

In a metanalysis made by Guidi et al, 2021, physical activity was found to be associated with lower allostatic load whereas poor sleep quality unhealthy diet and overweight, alcohol consumption and smoking habits were associated with high allostatic load levels.

Mammen and Faulkner (2013) concluded in a metanalysis that physical activity was positively associated with later onset of depression. As little as 10-30 minutes per day was found preventive and the intensity required was a brisk walk. The study also found that reducing the physical activity over time increased the risk of developing depression. But an increase, even later in life, decreased the likelihood.

Physical activity and exercise have shown to induce neurobiological adaptations. Structural changes in hippocampus, amygdala, striatum, and prefrontal cortex have been connected to early onset depression (Carek et al, 2011). Imaging studies have shown decreased hippocampal volume in depressed patients. One hypothesis regarding the benefits of exercise is an increased brain neurogenesis, i.e production of new brain cells. Another possible factor is the increased oxygen supply through increased heart rate and vascular health (Carek et al, 2011).

All the mechanisms underlying the effects physical exercise have on mental health are still not clear. Apart from increased brain function through neurogenesis and improved blood supply, research is also looking into the kynurenine metabolism. This is a quite complicated process but in short this is a process where skeletal muscles during physical exercise affects the kynurenine metabolism and turns kynurenine into kynurenine acid which is unable to cross the blood-brain barrier and therefore protects the brain from stress-induced depression (Agudelo et al, 2014).

Sleep

Sleep is believed to be a neural state where consolidation of memories take place and has an important function to maintain a balance in both the brain and body. Sleep makes the brain prepared for the next day (McEwan, 2006).

Sleep deprivation negatively affects cognition. The synaptic homeostasis hypothesis (SHY) proposes that sleep is the price the brain pays for its plasticity, the brain's ability to develop, modify its connections and rewire itself based on experience. During sleep, the brain reestablishes synaptic and cellular balance that has been challenged by plastic changes during the normal wake. This helps the brain to change yet keep the connections that are still important (Tononi & Cirelli, 2014).

Sleep has been proposed to play a key role in optimizing the conservation of energy by relocating energy reserves to essential biological processes such as cellular maintenance, anabolism (building up cells), immune function, and neural plasticity (creating new connections in the brain). The re-normalization of synaptic strength favors memory acquisition, consolidation, and integration. Sleep also supports brain waste clearance (Nollet et al., 2020).

The brain is the master regulator of the neuroendocrine, autonomic, and immune systems, as well as the behaviors that will regulate healthy or unhealthy choices of lifestyle. Chronic sleep deprivation, independently of the reason, has consequences that will impair brain function and contribute to allostatic load (stress) throughout the body (McEwan, 2006).

It is well established that sleep deprivation affects memory, learning and retrieval, as well as cognitive functions such as problem solving and decision making. There is also increasing evidence that long-term sleep deprivation constitutes a form of allostatic load (stress) which increases blood pressure, decreases parasympathetic tone, increases cortisol and insulin levels, and increases appetite. The sleep deprivation creates altered levels of cytokines, oxidative stress markers, glycogen levels in the brain and structural changes in terms of reduced neurogenesis (creation of new brain cells), in hippocampus. Sufficient glycogen levels help the brain function properly during periods of low glucose levels. (McEwan, 2006).

Already from a restriction to 6 hours per night, proinflammatory cytokine levels are increased which will negatively affect the immune system and increases inflammatory responses in the body. This will negatively affect the metabolic syndrome, which is the medical term for a combination of diabetes, high blood pressure and obesity. This will increase the risk for coronary heart disease and stroke (McEwan, 2006).

Stress is seen as the primary cause of insomnia and most research indicate a clear negative association between stress and sleep (Åkerstedt et al, 2012). The causal link is however not simple. Depression is almost universally associated with bad sleep and an overlap, comorbidity, between the two exists.

Poor sleep and subsequent negative effects on the brain may also negatively affect how to deal with other stressors on a daily basis.

Mindfulness

Mindfulness, in its broader sense, can be described as a state of consciousness in which individuals attend to ongoing events and experiences in a receptive and non-judgmental way. It includes awareness and registration of inner experiences such as emotions, thoughts, and behavioral intentions as well as external events received through all senses. Mindfulness is an experience of here and now instead of dwelling about the past or fantasizing about the future (Hülshager et al, 2012).

Mindfulness is an inherent and natural human capacity that can be experienced by everyone and not only in specific mindfulness training sessions. Naturally occurring mindfulness has shown to be related to psychological health in non-clinical samples (Hülshager et al, 2012).

A growing body of empirical evidence supports the effectiveness of mindfulness-based interventions to reduce symptoms in clinical samples and to promote physical well-being in non-clinical samples (Hülshager et al, 2012).

Metanalysis show that mindfulness is superior to no treatment and therapies like CBT and other behavioral therapies. It is also equivalent to medical treatment like selective serotonin reuptake inhibitors for treating depression. It has also shown to be moderately effective in reducing anxiety symptoms and improving mood (Saeed et al, 2019).

When mindful individuals attend to a situation in a receptive and non-judgmental way, they manage to observe stressful events more objectively and refrain to attach a meaning to it. This will help the individual to avoid biased, negative thought patterns that will over dramatize the situation (Hülshager et al, 2012).

Stressful situations create a variety of demands and challenges. Handling those with self-control and intense regulatory behavior will be cognitively and emotionally exhausting, which in the long run may lead to more severe and long-lasting forms of exhaustion. In contrast mindfulness promotes autonomous self-regulation and a higher degree of flexibility (Hülshager et al, 2012).

Research indicates that surface acting in a stressful situation negatively affects emotional exhaustion and general well-being. Surface acting can be described as trying to alter the outward emotional expression without changing the actual feeling, i.e suppressing negative emotions and faking positive ones. This is an effortful and mentally exhausting strategy since it affects the later steps of the emotional process after emotional cues have already been evaluated and physiological and behavioral responses are in place (Gross, 1998).

Emotion Focused Coping includes *Positive Reframing* - seeing it in a different light to make it more positive and looking for the good in what is happening and *Acceptance* - accepting the fact that it is happening and learning to live with it are examples of deeper acting. This is supported by mindfulness through targeting the initial steps of the emotion process. By decoupling the self from the event, the experience of the internal and external events can be handled more objectively without evaluation and judgement. Space for alternative evaluations in terms of positive reframing and acceptance can be made. Mindfulness creates a separation between the ego and the event.

Research question and purpose of paper

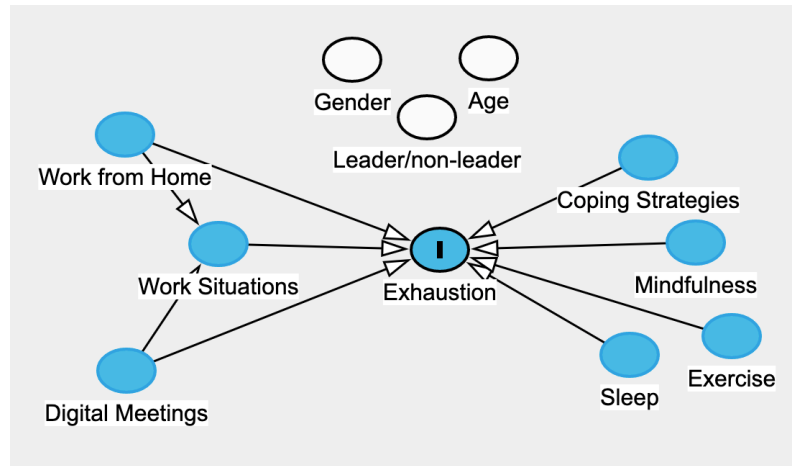


Figure 1. Dependent and independent variables for the research question

The overall research question is: What are significant risk factors for exhaustion and what resilience factors protect from exhaustion?

This unfolds into several sub questions:

- How are the different work-related conditions associated with exhaustion?
- How are work from home and digital meetings related to the different work-related conditions and are they directly associated with exhaustion?
- How are coping strategies associated with exhaustion?
- How are other protective health factors such as sleep, exercise and mindfulness associated with exhaustion?
- What factors can be used as predictors of exhaustion?

Method

Research participants

Respondents were recruited via the authors extended network. A link to the qualtrics survey together with explanatory text were posted on the authors LinkedIn and Facebook 4 times. A mail was also sent 3 times to 1355 newsletter subscribers of the authors newsletter and twice to the authors leadership management network groups with 107 members. An encouragement to spread the survey to friends and colleagues was made.

Data was collected between March 23 and April 21 – 2021. The survey was in Swedish.

A total of 419 data entries were collected and entries were deleted as follows:

- 89 did not fully finish the questionnaire
- 9 did not answer all the work-related conditions
- 6 did not answer all KEDS statements
- 5 did not answer all coping strategy statements

This led to a total of 310 respondents for further data analysis. Two respondents were not answering the question on gender and leader/non-leader and another two did not submit age. Eleven respondents did not answer the question on exercise at all and another seven answered 0. The decision was to still include them in overall data. Since all 310 respondents answered the questions about work-related conditions they may be considered working at the time of the survey.

With 310 respondents the power is .94 with an alfa of 0.05 for correlations of 0.2, meaning that the risk for a type II fault is 6%.

Respondents were possible to group based on gender and leader / non-leader with the distribution shown in table 5.

Table 5. Respondents distributed according to gender and leader / non-leader

	Leader	Non-Leader	Total
Female	74	108	182
Male	68	58	126
Total	142	166	308

A Chi-Square test showed a significant association ($\chi^2=1.131$, $p<.05$) between gender and leader, where leader roles are more common among men.

Age was ranging from 25 to 72 years with a mean of 51,4 years ($n=308$, $Sd=8.2$).

Material

Demographic Variables

The survey included demographic variables as gender, age, leader/non-leader (with direct reports - yes/no).

Exhaustion – KEDS

Karolinska Exhaustion Disorder Scale, KEDS (Besèr et al, 2013) was used in the survey, which is a reliable and previously validated type of survey.

KEDS includes 9 areas where each item has seven response alternatives, ranging from 0 – 6 (0 = experiencing minimal discomfort, 6 = maximal feeling of discomfort). Anchors are provided for the scale steps 0, 2, 4 and 6, but not for 1, 3 and 5.

The total sum of all items constitutes the outcome, which may vary between 0 to 54. A sum of all items ≥ 19 is in a clinical setting considered to indicate possible ED. The purpose of the study was however not to diagnose anyone.

Cronbach's alfa on standardized items for the 9 KEDS areas were .86.

Please see appendix 1 for statements used in the survey.

Working from Home and Digital Meetings

Number of days a week working from home (estimate based on the last month) and hours a week in digital meetings (estimate based on the last month) were measured.

Work-related conditions

All work-related conditions were developed by the author. The work-related conditions were inspired by and related to the areas Boundary Management, Meeting Culture, Transparency, Social Contacts and Technology. The used statements were not used as part of those constructs since they were not pre-validated through a factor analysis. A factor analysis was made for exploratory purposes but did not add up to the exact five constructs and the decision was therefore to stay with the 15 items as separate items. The decision was also to leave the factor analysis out of this study since that was not part of the focus.

Fifteen statements were used in the survey. Five statements were revers coded. The statements were measured with a 1-4 Likert Scale on how well each statement felt accurate based on the last months working situation (1 = not at all, 2 = to some point, 3 = rather well, 4 = very much). Meaning the higher rating, the more possible stressor.

A total working conditions score was calculated.

Cronbach's alfa on standardized items for the 15 work-related conditions were .76.

Please see Appendix 2 for statements used in the survey.

Coping Strategies

Based on the Brief Coping Scale (Carver, 1997) six coping strategies were used in the survey. These were grouped into the three main strategies - problem focused, emotion focused and socially supported strategies. The brief coping scale is a reliable and previously validated type of survey.

A total of 12 statements were used in the survey, 4 statements per main coping strategy. Coping strategies were measured as how often they were used when problems or challenges occur. A 1-4 Likert Scale was used (1= very rarely, 2 = rather rarely, 3 = quite often, 4 = very often). The Swedish version (Muhonen & Torkelson, 2005) was used.

Mean values for the three main coping strategies were used for further analysis.

No Cronbach's alfa was measures since there was only two items per construct.

Please see Appendix 3 for statements used in the survey.

Protective health factors

Sleep, exercise, and mindfulness were measured as additional protective factors for exhaustion. Sleep in number of hours per night. Exercise in times per week of exercise, where one session was defined as the equivalent to a minimum of 30 minutes of walk. Mindfulness was measured with the question – do you perform any type of mind recovery to ease your mind, e.g., meditation, mindfulness, yoga, nature experiences. A Likert scale 1-5 (1= Almost never, 2=a few times a month, 3=once a week, 4= several times a week, 5 = daily) was used. All factors were based on an estimated average for the past month.

Data Analysis

All data was imported from Qualtrics into SPSS version 27 for statistical analysis.

Means and standard deviations were calculated for all variables including specifics for gender and leader/non leaders, see Appendix 4.

Normal distribution was checked through histograms for all variables and deemed acceptable.

Pearson correlations between all variables in the study were calculated, see appendix 5.

Two different hierarchical multiple regression analysis were made to analyze the effects of the different variables on KEDS, see table 11 and 12.

Results

Exhaustion and associations with work-related conditions, and protectors

Exhaustion

Exhaustion (KEDS) was measured with a score of 0-54.

Mean value was 13.73 (Sd=8.22). 25.2% of the participants had a score of 19 or above for the KEDS score, which in a clinical setting, is the limit for diagnosed stress related exhaustion.

The result had a significant ($p<.01$) gender effect where 30.1% of the women had a score higher than 19 compared to 18.3% of the men. There was no significant difference for leaders/non-leaders.

Work-related conditions

The three most common work-related conditions ($m>2.5$) were “I miss creative meetings and time for brainstorming” ($m=2.99$, $Sd=1.01$), “We have no time for chit-chat and laughter between colleagues” ($m=2.65$, $Sd=.88$) and “I don’t really know what people outside my group do” ($m=2.63$, $Sd=.94$).

All work-related conditions had a positive significant association ($p<.01$) with the KEDS score, see table 6, indicating that more of the working condition was associated with higher exhaustion, where the causality may be either way. The two conditions with the highest significant association were “My work and my family/leisure time intertwines, the boundaries are unclear” ($r=.31$, $p<.01$) and “I don’t get the information I need to do a good job” ($r=.34$, $p<.01$).

The total work-related conditions score had a significant association of $r=.48$ ($p<.01$) with KEDS, no causality determined.

Table 6. Work-related conditions, mean value, standard deviation, and associations with Exhaustion

Work-related conditions	Mean (Sd) 1-4	Association with KEDS
Boundary Management		
My work and my leisure/family time intertwines, the boundaries are unclear	2.33	.31 **
I never leave work completely and I am always on	2.23	.26 **

I don't have clear routines for when, where and how I work	2.41	.29 **
Meeting Culture		
I am in meetings throughout the day without any longer breaks	2.18	.24 **
I do parallel tasking when in meetings, like reading mails or surfing	2.10	.24 **
We lack a good structure of our meetings and don't finish what we aimed for	2.20	.23 **
Transparency		
I don't get the information I need to do a good job	2.00	.34 **
I only get information deemed necessary, and seldom that little extra	2.20	.20 **
I don't really know what people outside my group do	2.63	.16 **
Social Contacts		
We have no time for chit-chat and laughter between colleagues	2.65	.15 **
I find it difficult to listen in and get a feeling for my colleagues' well-being	2.28	.16 **
I miss creative meetings and time for brainstorming	2.99	.21 **
Technology		
I don't have access to all the technical equipment I need, e.g., computer, camera,	1.54	.19 **
I lack fast and efficient technical support when technology is not working	1.77	.22 **
I lack the training required to be up to date and use technology in a good way	1.72	.25 **
Total Score (0-45)	18.24	.48 **

** $p < .01$ $N=310$

Work from Home and Digital Meetings

There were no significant associations between exhaustion and work from home ($r=.10$, $p>.05$) or number of digital meetings ($r=.06$, $p>.05$).

Work from home had a mean value of 3.84 days/week ($Sd=1.69$) and digital meetings had a mean of 17.50 hours/week ($Sd=10.06$). Working from home and hours of digital meetings were positively associated ($r=.40$, $p<.01$).

Work from home had a positive association with the total work-related conditions score ($r=.19$, $p<.01$) and number of digital meetings was also positively associated with the total work-related conditions score ($r=.29$, $p<.01$).

Work from home was significantly positively associated ($p<.01$) with several work-related conditions, see table 7, indicating that more hours of working from home was associated with more occurrence of the work-related conditions, no causality determined.

Table 7. Significant associations between Work from Home and Work-related conditions

Work Situation	Association with Work from Home
I am in meetings throughout the day without any longer breaks	.31 **
We have no time for chit-chat and laughter between colleagues	.21 **
I don't really know what people outside my group do	.20 **

I find it difficult to listen in and get a feeling for my colleagues' well-being	.20 **
My work and my leisure/family time intertwines, the boundaries are unclear	.16 **
I only get information deemed necessary, and seldom that little extra	.16 **

** $p < .01$ N=310

Digital meetings were also positively associated ($p < .01$) with some of the work-related conditions, see table 8.

Table 8. Significant associations between Digital Meetings and Work-related conditions

Work Situation	Association with Digital Meetings
I am in meetings throughout the day without any longer breaks	.67 **
I do parallel tasking when in meetings, like reading mails or surfing	.21 **
I miss creative meetings and time for brainstorming	.17 **
I never leave work completely and I am always on	.16 **
We have no time for chit-chat and laughter between colleagues	.16 **

** $p < .01$ N=310

Coping Strategies

Problem focused coping was most common with a mean value of 3.20 (Sd=.54) on the 1-4 Likert scale. Followed by emotion focused coping ($m=3.19$, $Sd=.48$) and socially supported coping ($m=2.65$, $Sd=.66$).

Problem focused coping ($r=-.15$, $p < .01$) and emotion focused coping ($r=-.23$, $p < .01$) had negative associations with exhaustion, see table 9, indicating higher coping capabilities associated with lower exhaustion but where the causality may be either way.

Table 9. Coping Strategies' associations with Exhaustion

Protective Health Factor	Mean (Sd) 1-4	Association with KEDS
Problem Focused Coping	3.20 (.54)	- .15 **
Emotion Focused Coping	3.19 (.48)	- .23 **
Socially Supported Coping	2.65 (.66)	- .10

** $p < .01$ N=310

Protective Health Factors

The mean value of exercise was 4.58 times per week ($Sd=2.72$), sleep had a mean value of 6.98 hours/night ($Sd=.80$) and mindfulness had a mean value of 2.77 ($Sd=1.32$) on a 1-5

Likert scale. All protective health factors had a significant negative association ($p < .01$) with the KEDS score, see table 10, indicating higher protective health factors were associated with lower exhaustion but where the causality may be either way.

Table 10. Protective Health Factors' associations with Exhaustion

Protective Health Factor	Mean (Sd)	Association with KEDS
Exercise (times/week)	4.58 (2.72)	- .22 **
Sleep (h/night)	6.98 (.80)	- .30 **
Mindfulness (1-5 Likert)	2.77 (1.32)	- .16 **

** $p < .01$ N=310

Sixty-six or 23% of all respondents were exercising less than 3 times a week, out of these 40% had a KEDS score of 19 or higher. This implies association not causality.

Predictors of Exhaustion

A first hierarchical regression analysis was made using the total work-related condition score and all the protective factors including coping strategies and protective health factors as predictors of KEDS and exhaustion

The result indicates that total work-related conditions predict KEDS ($R^2 = .22$, $F(1,288) = 81.77$, $p < .01$) and so does protective factors ($R^2 = .10$, $F(6,282)$, $p < .01$). Together they are explaining 30% of the variance in KEDS, see table 11.

Significance ($p < .05$) was shown for emotion based coping, sleep, and exercise in the protective factors.

Table 11. Hierarchical multiple regression analysis using work-related conditions and protective factors predicting KEDS

	Standardized coefficient β	Unstandardized coefficient B (Std Error)	95% Confidence interval for B		R^2 change
			Lower Bound	Upper Bound	
Stressors					.22
Work-related conditions Score	.39 ***	.51 (.07)	.38	.64	
Protective factors					.10
Problem Focused Coping	-.02	-.32 (.86)	-2.01	1.37	
Emotion Focused Coping	-.16 ***	-2.71 (.89)	-4.46	-.95	
Socially Supported Coping	.03	.43 (.68)	-.90	1.76	
Sleep	-.19 ***	-2.01 (.52)	-3.04	-.98	
Exercise	-.15 ***	-.45 (.16)	-.76	-.14	

Mindfulness	-.04	-.26 (.34)	-.92	.40
Adjusted R2 total				.30

*** $p < .01$ $N = 290$ $VIF < 1.3$ for all variables

To get a more detailed view of what more specifically is predicting KEDS and exhaustion in terms of work-related conditions, a multiple regression was made with only the work-related conditions. This showed significance ($p < .05$) for “My work and my leisure/family time intertwines, the boundaries are unclear”, “I do parallel tasking when in meetings, like reading mails or surfing” and “I don’t get the information I need to do a good job”.

The same was done for gender, age, leader/non-leader, working from home and digital meetings. This showed significance ($p < .05$) only for gender.

A second hierarchical multiple regression analysis was made based on the predictors showing significance ($p < .05$) in the analyses above for a clearer picture and to keep down the number of predictors in the analysis, see table 12.

This indicates that gender predict KEDS ($R^2 = .03$, $F(1,288) = 10.2$, $p < .01$), and so does work-related conditions ($R^2 = .21$, $F(3,285) = 26.4$, $p < .01$) and protective factors ($R^2 = .11$, $F(3,282) = 15.5$, $p < .01$). Together they are explaining 34% of the variance in KEDS.

Table 12. Hierarchical Multiple Regression analysis using gender, significant work-related conditions and protective factors predicting KEDS

	Stand. coefficient β	Unstand. coefficient B (Std Error)	95% Confidence interval for B		R ² change
			Lower Bound	Upper Bound	
Gender	-.19 ***	-1.05 (.27)	-1.58	-.51	.03
Stressors					.21
My work and my leisure/family time intertwines, the boundaries are unclear	.22 ***	1.92(.43)	1.08	2.78	
I do parallel tasking when in meetings, like reading mails or surfing	.14 ***	1.28(.45)	.40	2.16	
I don’t get the information I need to do a good job	.22 ***	2.45(.56)	1.34	3.56	
Protective factors					.11
Emotion Focused Coping	-.19 ***	-3.28(.83)	-4.91	-1.64	
Sleep	-.20 ***	-2.10(.51)	-3.10	-1.10	
Exercise	-.17 ***	-.50(.15)	-.79	-.21	
Adjusted R2 total					.34

*** $p < .01$ $N = 290$ $VIF < 1.1$ for all variables

The second model indicates that Gender ($\beta = -.19, p < .001$) predicts KEDS. The relationship was negative indicating that women are more inclined to high KEDS values than men.

In terms of work-related conditions, the following three gave a significant result, indicating that they predict KEDS and exhaustion, “My work and my leisure/family time intertwines, the boundaries are unclear” ($\beta = .22, p < .001$), “I do parallel tasking when in meetings, like reading mails or surfing” ($\beta = .14, p < .001$) and “I don’t get the information I need to do a good job” ($\beta = .22, p < .001$). All these relationships were positive, indicating that the more of the work-related condition present the higher KEDS value and exhaustion.

Emotion focused coping was showing a significant association (Positive Reframing and Acceptance) ($\beta = -.19, p < .001$), the relationship was negative indicating that the more the coping strategy was used the lower KEDS value. A negative relationship was also the case for exercise ($\beta = -.18, p < .001$) and sleep ($\beta = -.20, p < .001$) indicating that more sleep and more exercise lowered the KEDS value.

These factors were together explaining 34% of the variance in KEDS.

The linear regression formula to estimate KEDS based on the predictive variables was

$$31.5 - (1.05 * \text{Gender}) + (1.92 * \text{BM1}) + (1.28 * \text{MC2}) + (2.45 * \text{Tr1}) - (.50 * \text{Exercise}) - (2.10 * \text{Sleep}) - (3.28 * \text{Emotion Focused Coping})$$

BM1 - My work and my leisure/family time intertwines, the boundaries are unclear. MC2 - I do parallel tasking when in meetings, like reading mails or surfing. Tr1 - I don’t get the information I need to do a good job. Gender (F=1, M=4), Exercise is times per week, sleep is hours per night, the work-related conditions are a 1-4 Likert Scale with higher value indicates more of the situation, and the coping factor is a 1-4 Likert Scale with higher value indicating more often used as a strategy.

Please note that the gender coding (1,4) is how SPSS have chosen to code the data.

Discussion

The purpose of this paper is to look further into work-related conditions and protective factors affecting exhaustion. The collection of data occurred during the Corona pandemic, which may affect the result even though most of the results may be general. The questions have been - what adds to exhaustion, and what prevents exhaustion. Are there any learnings that can help more people thrive through tough times in general?

Working from home increased during the pandemic due to recommendations from authorities and it is also interesting to see how that has affected both different work-related conditions and the overall level of exhaustion. This is valuable knowledge in knowing how to deal with the new normal and hybrid working when all restrictions are gone.

Discussion of results

Levels of exhaustion

The KEDS score was unusually high. In the study, as many as 25.2% of the participants had a score of 19 or above, compared to earlier research indicating around 13% (n=1355) (Saboonchi et al, 2012). The mean value was 13.73 (Sd=8.22) to be compared with a study of 200 patients with diagnosed exhaustion and 117 healthy individuals that indicates a mean of

around 8 for healthy individuals and 30 for diagnosed individuals on the KEDS scale (Besèr et al, 2013).

Quite some research has been made on exhaustion in connection with the pandemic and Teixeira (2020) coined the term CORONEX defined as a long-term exhaustion induced by COVID-19. The general opinion is that the levels of exhaustion have increased during the pandemic.

The high levels are probably caused by additional stressors outside work due to worries and social isolation during the pandemic. It is in this light still interesting to see that as much as 22% of the variance in KEDS could be explained by work-related conditions.

Work-related conditions' effects on M.A.S.T.E.R and the brain

Three work-related conditions stood out in the prediction of KEDS and exhaustion. "My work and my leisure/family time intertwines, the boundaries are unclear", "I do parallel tasking when in meetings, like reading mails or surfing" and "I don't get the information I need to do a good job". All these relationships were positive, indicating that the more of the work-related condition present the higher KEDS value and exhaustion.

To explain why these may be of extra importance we can discuss them in the light of their effects on M.A.S.T.E.R. and the brain.

The intertwine of work and family/leisure time is a part of Boundary Management. This specific angle may negatively affect autonomy and the ability to choose where and when to do things, the sense of controlling different situations may be challenged when they are intertwined. The question of who am I, and what is my role right now may be difficult to answer if the switches between family roles and work roles are too frequent, and may create uncertainty. Unclear boundaries may also lead to less time for recovery from work-related stressors.

Perceived multi-tasking requires extra capacity from the prefrontal cortex as the brain will have to quickly shift between the tasks as the PFC can only focus on one thing at the time. This will exhaust the PFC and lead to an overall decreased efficiency and ability to perform well, which may also affect the sense of well-being.

Not getting the information needed to do a good job may affect several parts of M.A.S.T.E.R. The meaning may be lost if the information is not sufficient, autonomy to perform a good job is affected, being left out of the loop will decrease the perceived status and the feeling of uncertainty and not having the full truth will negatively affect M.A.S.T.E.R. Not having the information deemed necessary may negatively affect the sense of equality and fairness if there is any suspicion that others get more information which also goes for the sense of belonging that goes with sharing information.

Exactly how those have been affected for each individual is of course not possible to say based on the information in the data collection but are merely speculative thoughts.

Coping strategies for Resilience

According to Muhonen and Torkelson (2005), the most used coping strategies are active coping (problem focused), planning (problem focused) and emotional support (socially supported). In this study active coping (problem focused), acceptance (emotion focused), planning (problem focused) and positive reframing (emotion focused) were the most common. The question is if the unusual high level of emotion focused coping strategies is an effect of the specific crisis in terms of the Corona pandemic and if that fostered a higher

degree of accepting the situation as it is and trying to make something good out of it, or if the respondent group were special in this sense.

Emotion focused coping including reframing and acceptance was the only coping strategy that showed a significant effect in the regression analysis. This could possibly be explained by not much being possible to do about the cause of the situation during the pandemic and better effects were given for those coping by trying to change or reduce negative emotions elicited by the stressors.

Emotion focused strategies as acceptance and reframing are targeting the emotional perception, i.e., altering the interpretation of the situation, reducing the amygdala reaction and the physical stress response. Reframing changes the cognitive interpretation and with that the perception of the situation, making it less threatening. Acceptance lessens the focus and rumination of the situation also decreasing the amygdala reaction.

Socially supported coping was not significantly associated with exhaustion at all. One possible biological explanation to this could be that especially the emotional part of social support may include rumination and getting stuck in negative thoughts and emotions. Social support may also lessen the amount of self-control and sense of autonomy.

Gender effects

Gender is not the focus for this study, however, looking at the data it is interesting to notice some differences.

Even if some individuals might develop exhaustion more easily due to variations in biological constitution and/or low access to personal or social resources, exhaustion may affect anyone if the exchange between the individual and the environment is sufficiently challenging, long, and intense (Persson et al, 2016).

From a gender perspective, earlier research indicates that men and women who perform similar work also display similar physiological stress responses (Persson et al, 2009) and tend to develop similar types of health issues. Despite of this, in the broader population, women tend to score higher in exhaustion. Part of this is usually explained by men and women being in different types of professions and taking on different amounts of the unpaid work outside the office. As many as 57% of women and 48 % of men perceive that they have too much to do at work. (Sverke et al., 2016).

In the general population, more women than men fulfill the exhaustion criteria for KEDS (Saboonchi et al, 2012). This is in line with this study where 30.1% of the women had a score higher than 19 compared to 18.3% of the men.

Some earlier research has indicated gender effects also in coping strategies, where men more frequently use active coping and planning (problem focused), and women more frequently use emotional support (social support) (Muhonen & Torkelson, 2005). This study also indicated women being significantly ($p < .01$) more active in socially supported coping, there was also a slight ($p < .05$) difference in problem focused coping where women, not men, were using it more. How this could be explained by the type of situation the Corona pandemic created would be interesting to look further into or if the result is merely an effect of a skewed respondent group where other factors than gender is the explanation, e.g., education level, socioeconomic status, or other demographics.

Implications for practitioners

KEDS scores have a positive association with the odds of being an ED patient with an increase of 70.1% for every increase in the KEDS score of one point ($p < .0001$) for women and an increase of 38.8% for every extra point for men ($p < .0001$) (Besèr et al, 2013). This makes every point count in order to lower the risks of developing Exhaustion Disorder.

In Sweden, the employer is economically responsible for day 2 to 14 of an employee's sick leave. After that the economical responsibility is transferred to Försäkringskassan. This may lower the economical incitements of preventing long term sick leaves. However, the production and efficiency loss already at early signs of exhaustion and long before a sick leave is in place would give clear economical incitements for employers.

Employers taking the responsibility for the psychosocial environment seriously are growing. Not only due to legal aspects, efficiency of the employed brains, and an attractive employer brand, but also from an ethical humanistic perspective.

Lower KEDS values

The linear regression formula to estimate KEDS based on the predictive variables is

$$31.5 - (1.05 * \text{Gender}) + (1.92 * \text{BM1}) + (1.28 * \text{MC2}) + (2.45 * \text{Tr1}) - (.50 * \text{Exercise}) - (2.10 * \text{Sleep}) - (3.28 * \text{Emotion Focused Coping})$$

BM1 - My work and my leisure/family time intertwines, the boundaries are unclear. MC2 - I do parallel tasking when in meetings, like reading mails or surfing. Tr1 - I don't get the information I need to do a good job. Gender (F=1, M=4), Exercise is times per week, Sleep is hours per night, the Work-related conditions are a 1-4 Likert Scale with higher value indicates more of the situation, and the Coping factor is a 1-4 Likert Scale with higher value indicating more often used as a strategy.

If we allow ourselves to play with the numbers from the regression formula:

A woman sleeping 7 hours per night, exercising seven times per week (equivalent to 30 min brisk walk/day), having no work situation strains 1(4), and quite often using emotion focused coping strategies 3(4), will have a predicted healthy KEDS baseline of 8. For a man the same situation would give a KEDS score of 5.

If they would get into a situation where the work-related conditions all reach a 3(4), loosens one hour sleep/night, reduces the level of exercise to 3 times/week, and uses less of emotion focused coping 2(4) the predicted score would be 27 for a woman and 24 for a man. Scores well above the limit of 19 which is the cut off score between healthy individuals and people being diagnosed with Exhaustion Disorder.

This would call for some actions.

Possible interventions may be divided into different areas:

- Psychoeducation and motivation for personal change
- Coaching / therapy for deeper personal changes
- Workspace, ways of working and leadership changes to reduce level of stressful work-related conditions

Below is an example of how different interventions could affect the predicted KEDS score and level of exhaustion. Reality is of course much more complex, yet the idea is to get a hint of possible effects. It is worth noting that high levels of exhaustion may lead to both

cognitive, mental, and physical inabilities which will make interventions harder. Indicating that the earlier interventions are made the better.

Psychoeducation and motivation for personal change

Factors possible to affect through psychoeducation and motivation are sleep, exercise, and multitasking. I.e., factors that are fairly simple to change once you are aware of the consequences. Even though there might be deeper aspects stopping actual change, knowing the profound effects of sleep, exercise and multitasking may with the right level of motivational incitements lead to a change.

By “just” adding an extra hour of sleep, increase the level of exercise to 7 times per week and lower parallel tasking to “rarely” 2(4), the predicted KEDS score will drop to 21 for women and 18 for men compared to the earlier example.

Coaching / therapy for deeper personal changes

Factors like boundary management and emotional coping strategies may be affected through coaching and cognitive therapy. The right support may help find strategies for better time and boundary management. With the support of a skilled coach/therapist there is also possible to increase the ability of both reframing and acceptance.

With support that lowers “My work and my leisure/family time intertwines, the boundaries are unclear” with one point to a 2(4) which means that the statement is only correct to a certain degree, and an increase of emotional coping strategies from a 2 to a 3(4) which means that the strategy is used quite often, the predicted total score would be 16 for women and 13 for men if the psychoeducational interventions above are also in place.

CBT treatment has shown a positive effect on future sick-leaves for patients not at sick-leave when the treatment started. This also included other positive effects such as fewer visits to health care and less medication, (Hägglund et al, 2015). The same types of treatment for patients already on sick leave showed no such improvements. The authors point at the possibility of patients with low incitements of returning to work not being susceptible to the treatment. This is pointing at the importance of using targeted treatments for each individual. It is also likely that high levels of exhaustion by itself will make the individual less capable of the cognitive aspects of CBT.

Workspace, ways of working and leadership changes to reduce level of stressful work-related conditions

The interventions above may be supported and initiated by the employer, even if the change is made by the individual. “Getting the information needed to do a good job” is more of a leadership and employer responsibility.

Assuming that changes can be made lowering this to a perceived level of only being true to a certain level 2(4) instead of being a fairly good explanation 3(4) of the situation at work, the predicted KEDS score would drop to 14 for women and 11 for men, based on all earlier interventions being in place.

These are all examples to show that effects can be made. A real-life situation would require further specific analysis for every specific individual and corporation.

New hybrid ways of working post-Covid

Work from home and digital meetings are most likely here to stay in one form or another. Even if they are not directly associated with KEDS, they are significantly associated with some of the work-related conditions. This means work-related conditions that may still require some attention if they are considered un-wanted by the employees.

Work from Home was significantly associated with:

- I am in meetings throughout the day without any longer breaks ($r=.31, p<.01$)
- We have no time for chit-chat and laughter between colleagues ($r=.21, p<.01$)
- I don't really know what people outside my group do ($r=.20, p<.01$)
- I find it difficult to listen in and get a feeling for my colleagues' well-being ($r=.20, p<.01$)
- My work and my leisure/family time intertwines, the boundaries are unclear", ($r=.16, p<.01$)
- I only get information deemed necessary, and seldom that little extra ($r=.16, p<.01$)

"My work and my leisure/family time intertwines, the boundaries are unclear" was also identified as a predictor of KEDS and exhaustion.

Number of Digital Meetings showed significant associations for:

- I am in meetings throughout the day without any longer breaks ($r=.67, p<.01$),
- I do parallel tasking when in meetings, like reading mails or surfing ($r=.21, p<.01$),
- I miss creative meetings and time for brainstorming ($r=.17, p<.01$).
- I never leave work completely and I am always on ($r=.16, p<.01$)
- SC1 - We have no time for chit-chat and laughter between colleagues ($r=.16, p<.01$).

Where "I do parallel tasking when in meetings, like reading mails or surfing" was identified as a predictor of KEDS and exhaustion.

These factors could be used as a starting point in discussing the pros and cons of working from home and digital meetings. Further discussions in a work environment should be how to minimize those effects if considered negative from a work satisfaction perspective. Interesting would be to discuss how to find new ways of working that will reduce those effects and cater for better boundary management, stronger social interactions, and better flow of information.

Implications for research

How the corona pandemic has affected general mental health and long-term exhaustion problems is too early to say. A lot of research is specifically made in the area and a lot of research not intended to specifically cover effects of Covid-19 will still be affected by it. This study adds to the picture of an increased pandemic effect on exhaustion.

The study also indicates that working from home and digital meetings are not a cause for exhaustion, but extra attention needs to be directed towards how these ways of working need to be tailored in order not to create or fuel work-related conditions that may increase exhaustion.

The field of resilience and protection from exhaustion has more knowledge to be gained in order to prevent more individuals from exhaustion diagnoses. Increased employee

responsibility for the psychosocial work environment together with costs for society and individual suffering makes this an important area.

Causalities

Causation is not possible in this type of study and more longitudinal studies including interventions would be desirable to show clear causalities.

The associations between the work-related conditions and KEDS may be casual in terms of the work-related conditions causing heightened levels of exhaustion, however there is also most likely a reverse causation where higher levels of exhaustion affect the perceived situations at work or the ability to efficiently function in a social environment.

This will also be the case in the resilience factors where the ability to sleep, exercise and be mindful is affected by the exhaustion level. As well as the ability to efficiently use different coping strategies.

Limitations and sources for errors

The study was limited to a number of work-related stressors chosen by the author, not taken into account other work-related stressors or stressors related to other aspects of life. The study was also limited in time and performed during very special circumstances in terms of the pandemic.

This also goes for the concept of resilience which in this study was represented by coping strategies and protective health factors as sleep, exercise, and mindfulness.

There are several possible sources for errors. The survey was made in the middle of the corona pandemic which created an unnatural situation both in terms of work-related conditions and additional stressors affecting the exhaustion level. The expectation was that the levels of exhaustion would be higher than normal due to other external stressors, but that the use of coping strategies and protective health factors would still be used and with similar effects as in a normal situation, since those would be more of personal traits.

The respondents were collected from the authors extended network which of course is a risk for a non-representative subset of the population. The pool was however from a broad professional network built from a 20-year professional background in a large variety of sectors and companies.

The work-related conditions were chosen by the author. They were based on earlier research, as described in the theory section, but the work situation part of the questionnaire was not a pre validated test. The work-related conditions were therefore used as single items and not as constructs even if they belonged to different areas. Further tests and factor analysis would be required for a construct-based test.

Self-evaluation tests distributed over internet have the error source of respondents misunderstanding the question and intention and therefore giving an incorrect answer. Adding reversed questions has the advantage of keeping the attention of the respondent but may also create incorrect answers if the question is misinterpreted.

Exercise was defined as numbers of times per week, where one time was defined as a minimum of 30 min at a pace of a brisk walk or higher. Individuals with a high level of exercise level may have counted only what they perceive “real” training and neglected additional brisk walks during the day.

Mindfulness included “nature experience” as a mean to mindfulness, this may have been interpreted as a less “mindful”, awareness in the presence, than intended by the author. This may also explain the lower associations and regression effect than what could be expected based on earlier research.

Conclusions

Exhaustion is an increasing and costly problem on societal, corporate, and individual level. As knowledge increase about causes and protective factors, tools, and methods to address the problem emerge. Psychoeducation, coaching, leadership and changed ways of working will together support organizations and individuals in creating a better psychosocial environment. An environment where every brain may perform on its individual optimum, where goals are met, and where fun is a natural part of working life.

We need joint efforts from the employer and the individual to lower the exhaustion rate. Some of the changes and work required by the individual may also be supported and facilitated by the employer. Together and with an open mind we can make a difference.

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Appendix 1 – KEDS Survey

A 0-6 Likert Scale for each area. (kedsstresstest.com, 2021)

Ability to concentrate

The ability to keep your thoughts together and concentrate on various activities. How you function in various activities that demand different levels of concentration, e.g., reading a complicated text, reading a newspaper article, and watching TV.

Ranging from no difficulties to concentrate, to not being able to concentrate on anything at all. A healthy level may include occasional difficulties in holding thoughts together on things that normally attracts attention

Memory

The ability to remember things. Whether or not you have had difficulties recalling names, dates, or tasks that you intend to do during a regular day.

Ranging from being able to remember names, dates, and what to do, to daily forgetting important things or promises made. Sometimes forgetting but being able to remember when pulling oneself together is still considered to be on the healthy side

Physical stamina

Do you feel, for example, more exhausted than usual after the activities of an ordinary day or some form of physical exertion?

Ranging from feeling normal and performing daily physical activities or exercise as usual, to feeling weak and not being able to move even short distances. Experiencing that physical effort is more exhausting than normal, but still being able to move and exercise as usual is still on the healthy side

Mental stamina

To what extent are you more mentally exhausted than usual in various everyday situations

Ranging from having as much energy as usual and not having any difficulties performing daily activities, to not having the energy to do anything. Being able to manage everyday activities, even though they take more energy and creates a feeling of being exhausted more quickly than usual is still on the healthy side. Including having to take more breaks than usual

Recovery

How well and how quickly you recover mentally and physically when you have been exhausted.

Ranging from not having to rest during the day, to feeling unable to recharge the batteries no matter how much rest is had during the day. Becoming tired during the day if a little break is all that is needed to recover is on the healthy side

Sleep

How long you have slept and the quality of your sleep during the past weeks. This shall reflect your actual sleep, regardless of whether sleeping pills have been taken.

Ranging from sleeping well and long enough and feeling thoroughly rested when waking up in the morning, to sleeping superficially and restlessly every night and never feeling

thoroughly rested. Sometimes having problems like sleeping restlessly, waking up during the night or not feeling totally rested in the morning is still on the healthy side

Hypersensitivity to sensory impressions

The extent to which one or more of your senses have become more sensitive to impressions, such as sound, light, smell, or touch.

Ranging from senses not being more sensitive than usual, to having to withdraw to give the senses a chance to rest since sound, light or other sensory impressions bother too much. Sometimes experiencing sensory impressions like sound or light as disturbing or unpleasant is still on the healthy side

Experience of demands

How you react to demands in your daily life. These demands can come from your surroundings or be your own demands on yourself.

Ranging from the ability to do what is supposed to be done without experiencing it as demanding and difficult, to experiencing nearly everything as demanding and not being able to handle it at all. Sometimes experiencing daily situations as more demanding than they normally feel, creating a feeling of unease is still in the range of normal

Irritation and anger

How easily irritated or angry you become, regardless of whether you show it or not. Think especially about how quick tempered you have been in relationship to the source of your irritation, and how often and intensively you have become angry or irritated.

Ranging from not feeling especially easily irritated, too often feeling furious and having to make an enormous effort to restrain oneself. Being more easily impatient and irritated if the feeling quickly passes is still on the healthy side

Appendix 2 – Statements for Work Stressors

A 1-4 Likert Scale. Not at all, To a certain degree, Fairly good, Exactly

(R) indicates a reversed coded statement

Boundary Management – work-life balance

- BM1 - My work and my leisure/family time intertwines, the boundaries are unclear
- BM2 - I never leave work completely and I am always on
- BM3 - I don't have clear routines for when, where and how I work (I have clear routines for when, where and how I work (R))

Meeting Culture – efficient meetings serving a purpose

- MC1- I am in meetings throughout the day without any longer breaks
- MC2 - I do parallel tasking when in meetings, like reading mails or surfing
- MC3 - We lack a good structure of our meetings and don't finish what we aimed for (We have a good structure in our meetings and manage to finish what we aimed for (R))

Transparency – access to information

- Tr1 - I don't get the information I need to do a good job (I get the information I need to do a good job (R))
- Tr2 - I only get information deemed necessary, and seldom that little extra
- Tr3 - I don't really know what people outside my group do

Social Contacts – building trust

- SC1 - We have no time for chit-chat and laughter between colleagues (We have created room for chit-chats and laughter among colleagues (R))
- SC2 - I find it difficult to listen in and get a feeling for my colleagues' well-being
- SC3 - I miss creative meetings and time for brainstorming

Technology – well-functioning technical environment

- Te1 - I don't have access to all the technical equipment I need, e.g., computer, camera, internet access and programs (I have access to all the technical equipment I need, e.g computer, camera, internet access and programs (R))
- Te2 - I lack fast and efficient technical support when technology is not working
- Te3 - I lack the training required to be up to date and use technology in a good way

Appendix 3 – Statements for Coping Strategies

A 1-4 Likert Scale. Rarely, Not so often, Quite often, Very often

Problem Focused Coping

Planning

- I've been trying to come up with a strategy about what to do
- I've been thinking hard about what steps to take

Active coping

- I've been concentrating my effort on doing something about the situation I'm in
- I've been taking action to try to make the situation better

Emotion Focused Coping

Positive reframing

- I've been trying to see it in a different light, to make it seem more positive
- I've been looking for something good in what is happening

Acceptance

- I've been accepting the reality of the fact that it has been happening
- I've been learning to live with it

Socially Supported Coping

Emotional support

- I've been getting emotional support from others
- I've been getting comfort and understanding from someone

Informational support

- I've been getting help and advice from other people
- I've been trying to get advice or help from other people about what to do

Appendix 4 – means and standard deviations for all variables

Means and standard deviations for all variables including means and standard deviations divided into sex and leader/non-leader.

Table 14. Means and standard deviations for all variables

	All m(Sd)	Female	Male m(Sd)	Leaders m(Sd)	Non-leaders
Work from Home(days/week)	3.84 (1.69)	4.04 (1.55)	3.53 (1.83)	3.42 (1.81)	4.19 (1.50)
Digital Meetings (h/week)	17.50 (10.06)	18.57 (10.35)	15.74 (9.24)	20.12 (10.17)	15.28 (9.43)
BM1 (1-4)	2.33 (.94)	2.34 (.99)	2.31 (.89)	2.44 (.94)	2.24 (.94)
BM2 (1-4)	2.23 (.94)	2.27 (.96)	2.15 (.92)	2.38 (.99)	2.10 (.88)
BM3 (1-4)	2.41 (.91)	2.46 (.94)	2.34 (.87)	2.51 (.89)	2.34 (.92)
MC1 (1-4)	2.18 (.97)	2.37 (1.00)	1.90 (.86)	2.35 (1.02)	2.04 (.92)
MC2 (1-4)	2.10 (.89)	2.10 (.92)	2.10 (.87)	2.11 (.90)	2.10 (.89)
MC3 (1-4)	2.20 (.73)	2.25 (.72)	2.13 (.75)	2.13 (.67)	2.26 (.78)
Tr1 (1-4)	2.00 (.73)	2.05 (.72)	1.93 (.74)	1.94 (.68)	2.06 (.76)
Tr2 (1-4)	2.20 (.88)	2.28 (.92)	2.07 (.80)	2.03 (.90)	2.34 (.84)
Tr3 (1-4)	2.63 (.94)	2.64 (.90)	2.62 (.99)	2.48 (.90)	2.77 (.95)
SC1 (1-4)	2.65 (.88)	2.72 (.89)	2.54 (.84)	2.52 (.90)	2.77 (.84)
SC2 (1-4)	2.28 (.86)	2.25 (.88)	2.33 (.84)	2.21 (.86)	2.34 (.86)
SC3 (1-4)	2.99 (1.01)	3.04 (1.02)	2.91 (1.00)	3.03 (.95)	2.96 (1.06)
Te1 (1-4)	1.54 (.71)	1.64 (.76)	1.38 (.59)	1.45 (.68)	1.61 (.73)
Te2 (1-4)	1.77 (.93)	1.84 (.94)	1.69 (.91)	1.83 (.96)	1.72 (.90)
Te3 (1-4)	1.72 (.82)	1.83 (.84)	1.58 (.76)	1.72 (.80)	1.73 (.83)
Total Work-related conditions	18.24 (6.31)	19.09 (6.22)	16.99 (6.29)	18.14 (6.42)	18.38 (6.22)
Problem Focused Coping (1-4)	3.20 (.54)	3.25(.54)	3.14 (.52)	3.26 (.50)	3.16 (.56)
Emotion Focused Coping (1-4)	3.19 (.48)	3.20 (.48)	3.17 (.50)	3.23 (.46)	3.15 (.50)
Socially Supported Coping (1-4)	2.65 (.66)	2.75 (.66)	2.51 (.64)	2.64 (.60)	2.67 (.71)
Exercise (times/week)	4.58 (2.72)	4.80 (2.81)	4.25 (2.57)	4.64 (2.82)	4.53 (2.63)
Sleep (h/night)	6.98 (.80)	7.00 (.78)	6.96 (.82)	6.93 (.79)	7.03 (.80)
Mindfulness (1-5)	2.77 (1.32)	2.77 (1.33)	2.77 (1.31)	2.72 (1.31)	2.81 (1.33)
KEDS (0-54)	13.73 (8.22)	15.08 (8.64)	11.82 (7.18)	12.75 (8.25)	14.59 (8.15)

N=308

BM – Boundary Management, MC – Meeting Culture, Tr – Transparency, SC – Social Contacts, Te - Technology

Appendix 5 – Correlations between all variables

Variable	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28
1 Age	1																											
2 Gender	.11	1																										
3 Leader role	-.09	-.13 *	1																									
4 Work from Home	.00	-.15 *	.22 **	1																								
5 Digital meetings	-.02	-.14 *	-.24 **	.40 **	1																							
6 WS - BM1	.00	-.02	-.11	.16 **	.14 *	1																						
7 WS - BM2	-.02	-.06	-.15 *	.02	.16 **	.57 **	1																					
8 WS - BM3	.02	-.07	-.10	.14 *	.13 *	.51 **	.44 **	1																				
9 WS - MC1	-.04	-.24 **	-.16 **	.31 **	.67 **	.24 **	.26 **	.25 **	1																			
10 WS - MC2	-.16 **	.00	-.01	.03	.21 **	.13 *	.24 **	.21 **	.31 **	1																		
11 WS - MC3	-.01	-.08	.09	-.06	.02	.07	.14 *	.23 **	.14 *	.15 **	1																	
12 WS - Tr1	.02	-.08	.08	.02	.09	.09	.12 *	.09	.15 *	.09	.25 **	1																
13 WS - Tr2	.00	-.12 *	.18 **	.16 **	.05	.07	.07	.04	.16 **	.09	.10	.31 **	1															
14 WS - Tr3	.07	-.01	.15 **	.20 **	.10	.04	.03	.13 *	.17 **	.12 *	.17 **	.18 **	.40 **	1														
15 WS - SC1	.04	-.10	.14 *	.21 **	.16 **	.10	.08	.16 **	.19 **	.09	.10	.29 **	.32 **	.24 **	1													
16 WS - SC2	.04	.05	.08	.20 **	.10	.09	.04	.19 **	.15 **	.19 **	.08	.08	.37 **	.43 **	.27 **	1												
17 WS - SC3	.24 **	-.06	-.04	.10	.17 **	.22 **	.22 **	.27 **	.24 **	.15 **	.22 **	.18 **	.25 **	.31 **	.15 **	.28 **	1											
18 WS - Te1	-.11	-.18 **	.11	-.03	.01	.08	.01	.08	.08	-.02	.18 **	.30 **	.12 *	.10	.13 *	.06	.06	1										
19 WS - Te2	.01	-.08	-.06	-.11 *	.03	.06	.09	.10	.15 **	.10	.20 **	.16 **	.21 **	.16 **	.02	.13 *	.16 **	.24 **	1									
20 WS - Te3	.05	-.15 **	.00	-.07	-.06	.08	.14 *	.13 *	.09	.15 *	.12 *	.20 **	.23 **	.21 **	.12 *	.12 *	.20 **	.27 **	.41 **	1								
21 WS Total Score	.03	-.16 **	.02	.19 **	.29 **	.49 **	.50 **	.55 **	.52 **	.43 **	.41 **	.46 **	.52 **	.52 **	.45 **	.49 **	.57 **	.34 **	.44 **	.47 **	1							
22 Exercise	.06	-.10	-.02	.20 **	.08	-.11	-.14 *	-.14 *	-.01	-.08	-.04	-.04	-.03	-.01	.00	-.04	.02	.01	-.09	.05	-.09	1						
23 Sleep	.03	-.02	.06	.06	-.04	-.16 **	-.16 **	-.11 *	-.10	-.04	-.12 *	-.15 **	-.09	-.17 **	-.02	-.06	-.15 **	-.07	-.08	-.06	-.22 **	.10	1					
24 Mindfulness	.12 *	.00	.03	.11	.04	-.08	-.10	-.10	-.08	-.10	.00	-.06	.03	-.03	-.07	-.02	-.01	-.03	-.02	.03	-.09	.30 **	.10	1				
25 Problem Focused Coping	-.12 *	-.11	-.09	-.01	.08	-.06	-.08	-.18 **	.05	-.15 *	.26 **	-.12 *	-.01	-.02	-.16 **	-.10	-.10	-.04	.08	.00	-.15 *	.06	.07	.23 **	1			
26 Emotion Focused Coping	.06	-.03	-.09	-.08	.01	.03	.01	-.06	-.03	-.12 *	-.16 **	-.16 **	-.12 *	-.08	-.18 **	-.22 **	-.08	-.04	-.06	-.07	-.18 **	.01	.01	.15 *	.31 **	1		
27 Socially Supported Coping	-.14 *	-.18 **	.02	-.05	.02	-.11	-.04	-.02	.00	.01	-.14 *	-.17 **	-.19 **	-.12	-.24 **	-.17 **	-.11	-.05	-.09	-.09	-.21	.04	.11	.07	.36 **	.14 *	1	
28 KEDS	-.10	-.20 **	.11 *	.10	.06	.31 **	.26 **	.29 **	.24 **	.24 **	.23 **	.34 **	.20 **	.16 **	.15 **	.16 **	.21 **	.19 **	.22 **	.25 **	.48 **	-.22 **	-.30 **	-.16 **	-.15 **	-.23 **	-.10	1