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UNIVERSITET

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Affect regulation and exhaustion disorder: what's the connection?

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Psykiaterexamenuppsats. 2018

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Abstract

The present study examines if there is a link between symptom reduction of exhaustion and improved affect regulation. Twenty-six patients with exhaustion disorder according to National Board of Health and Welfare (NBHW) criteria participated in 6 to 14 CBT-based (11 patients) or PDT/IPT-based treatment (15 patients) sessions focusing on symptom reduction and attunement to various bodily sensations: fatigue, stress level and emotion. The questionnaires KEDS, DERS and HADS were collected at the start of treatment, at the end of treatment and at a three-month follow-up. The patient group showed significant improvements on all used measures of self-rated health, i.e. level of exhaustion, affect regulation, depression and anxiety, after treatment and at three-month follow-up. Emotion regulation means were above the cutoff at all three intervals, indicating poorer emotion regulation for this sample of participants with exhaustion disorder. Hence, the results suggest that there is a connection between emotion regulation and exhaustion. Though causality cannot be presumed, the findings support that both parameters may mediate the other. In summary, the study's clinical implication is that enhancing an individual's capacity for healthy emotion regulation could be a salutogenic factor for stress management.

Keywords: emotion regulation, affect regulation, burnout, exhaustion disorder, stress, KEDS, DERS, HADS, primary care, stress management.

Sammanfattning

Denna studie undersöker om det finns en koppling mellan minskade symtom av utmattningssyndrom och förbättrad affektreglering. Tjugosex patienter med utmattningssyndrom utifrån Socialstyrelsens kriterier deltog i 6 till 14 KBT- (11 patienter) eller PDT/IPT-fokuserade (15 patienter) behandlingstillfällen som fokuserade på symtomlindring och ökad uppmärksamhet på olika kroppsliga sensationer: utmattning, stressnivå och känslor. Frågeformulär med skalorna KEDS, DERS och HADS fylldes i vid början och slutet av behandlingen samt vid tremånaders-uppföljningen. Patientgruppen visade signifikanta förbättringar på samtliga använda självskattningsskalor, dvs på de självrapporterade måtten av utmattning, affektreglering, ångest och depression, efter behandlingen och vid tremånaders-uppföljningen. Medelvärdena för affektreglering var över skalans kritiska gräns vid alla tre mättillfällena, vilket indikerar sämre affektreglering för dessa deltagare med utmattningssyndrom. Studiens resultat indikerar att det finns en koppling mellan affektreglering och utmattning. Även om resultaten inte kan visa på kausalitet, indikerar studiens fynd att båda parametrar kan mediera varandra. Sammanfattningsvis visar studien på att behandling som fokuserar på att öka en individs förmåga till hälsosam affektreglering kan vara en salutogen faktor för stresshantering.

Nyckelord: känsloreglering, affektreglering, utbrändhet, utmattningssyndrom, stress, KEDS, DERS, HADS, primärvård, stresshantering

Acknowledgments

We want to thank our supervisor Per Johnsson who, at the end of a meeting, always leaves a true sense of having being seen and heard. Thank you also for sharing your vast knowledge. We want to thank our patients for their participation and willingness to share their experiences of emotion and exhaustion with us. We thank our six children (three each!) and husbands for hanging in there during these three years of studies that have taught us so much.

Table of contents

Introduction	1
Theory	2
Occupational stress and burnout	2
Exhaustion disorder	3
Anxiety	5
Depression	5
Affect and affect regulation theory	6
Affect regulation, stress and exhaustion	13
Aims	15
Methods	15
Ethics	15
Participants	15
Procedure	16
Instruments	16
Treatment	17
Data analysis	17
Results	18
Descriptive statistics	18
Scale reliability	18
Correlations	19
Pre- to post- treatment changes	20
Subgroup analysis	21
Discussion	21
References	29

Introduction

Mental health problems, of which anxiety, depression, and stress-related disorders are the most common diagnoses, are responsible for approximately 44% of sick leave cases in the Swedish workforce. Since 2014, common mental disorders (CMD) are the predominant cause of sick leave in Sweden. Approximately half of the 189,000 individuals on sick leave in September 2016 had diagnoses in the ICD-10 category F43, namely adjustment disorders and reactions to severe stress (Försäkringskassan, 2017). The causes of CMD are not fully known but are assumed to be multifactorial, including both biological and environmental influences. The personality trait neuroticism, early life experiences and dysfunctional emotional regulation are but few examples of possible etiological factors (Salomonsson, 2018; Söllner et al., 2016). As a cause, confounder and contributing factor, affect or emotion regulation (the terms will be used synonymously from this point) has been studied in a number of contexts pertaining to psychological well-being and psychiatric conditions, both in transdiagnostic terms and in conjunction with specific diagnoses (Bergsten, 2015; Thoma & McKay, 2015; Olsson, 2010). Furthermore, affect regulation in and of itself is the focus of multiple treatment methods and protocols (e.g. Abbass, 2015; Della Selva, 2004; Fosha, 2000; Gilbert, 2010; Gratz, Tull & Levy, 2014). Stress-related exhaustion and related concepts have similarly been studied extensively, both in Swedish and international contexts (e.g. Andela, Truchot & Van der Doef, 2016; Österberg et al., 2016; Maslach & Leiter, 2016; Grossi et al., 2015). Given the prevalence of sick leave due to psychological factors and the mounting evidence for the impact of affect regulation on psychological well-being, it was of particular interest to investigate the potential relation between affect regulation and exhaustion disorder as defined by the Swedish diagnostic criteria.

Theory

Occupational stress and burnout

The first reported use of the term burnout was in 1974 by Freudenberger, followed in 1976 by the first of Christina Maslach's numerous publications on the topic (Glise, 2014). Maslach and colleagues have defined burnout as "a psychological syndrome emerging as a prolonged response to chronic interpersonal stressors on the job". The three main dimensions of burnout are exhaustion, cynicism and ineffectiveness. Maslach & Leiter have since studied contributing mechanisms to the burnout response, mechanisms of organizational change to prevent and reduce burnout as well as individual-based burnout profiles (Maslach & Leiter, 2016; Leiter & Maslach, 2016). Their work has been in a Northern American setting and places an emphasis on the organizational and work-related context of burnout.

Attempts at labeling burnout or severe occupational stress as a formal or psychiatric diagnosis have been made in Northern Europe, for example in the Netherlands, Germany and Sweden. In the Netherlands, the term "overspannenheid" or overstrain is used to indicate burnout. As will be explained in the next section, Sweden has gone one step further and has included exhaustion disorder as a formal diagnosis in ICD-10, with economic and health-care implications. Maslach & Leiter (2016) reflect on possible mechanisms, including fear of disability claims, for possible reluctance in North America to follow in similar footsteps and the negative consequences of lack of proper diagnostic criteria on treatment and return to work. In the Netherlands, where sick leave rates have been comparable to those in Sweden, the implementation of strategic interventions in economic, employer, sick leave and treatment policies have been effective in reducing disability rates (Salomonsson, 2018).

When reviewing the literature, several terms describing work-related stress symptomatology are encountered: (emotional) burnout and (emotional) exhaustion are common terms as well as chronic stress, exhaustion syndrome, long-term occupational stress, compassion fatigue, stress-related exhaustion and stress-related mental disorders. The terms show considerable overlap. In the following, the terms exhaustion disorder, ED and exhaustion will be used interchangeably and will refer specifically to the Swedish diagnostic criteria for ED/utmattningssyndrom, unless otherwise specified.

Exhaustion disorder

Exhaustion disorder (ED) is in Sweden classified as F438.A Utmattningssyndrom, as an extension made in 2005 to the ICD classification for reactions to severe stress F43.8 (Persson et al., 2016). Socialstyrelsen, or The Swedish Board of Health and Welfare (NBHW), has defined the national diagnostic criteria. The disorder is characterized by physical and mental symptoms of exhaustion with a duration of at least two weeks, markedly reduced mental energy, and at least four of the following symptoms during the same 2-week period: subjective cognitive impairment, difficulties in coping with demands or under time restraints, emotional instability, sleep disturbances, physical weakness or fatigability and physical symptoms (Persson et al., 2016). By definition symptoms must cause clinically significant distress or impairment. Changes in executive function and attention (Krabbe et al., 2017), neural activation (Malmberg Gavelin et al., 2017), heart rate variability (Kanthak et al., 2006), emotion regulation and functional connectivity in the brain (Golkar et al., 2014) associated with chronic stress and exhaustion have been found. Golkar and colleagues reported that subjects with burnout symptoms related to occupational stress had a reduced capacity for downregulating negative emotion when compared to a control group. Connectivity between the amygdala and the anterior cingulate cortex was directly associated with the ability to downregulate emotion, and by means of functional MRI this connectivity was found to be weaker among burnout subjects.

The Swedish Board of Health and Welfare deemed 2003 that about half of those suffering from ED were also clinically depressed (Socialstyrelsen, 2003) and therefore recommended that depression or other relevant psychiatric comorbidity such as dysthymia or generalized anxiety disorder be used as the primary diagnoses where applicable, using ED as a complementary diagnosis. Due to a multitude of diagnostic confounders, the Swedish diagnostic guidelines, evidence for comorbidity among CMD and sampling diversity to name a few, the reported incidence of exhaustion disorder varies between 6-30% (Salomonsson, 2018).

The NHBW's current (2017) recommendations for sick leave for exhaustion disorder include part- or full-time sick leave for up to 12 months. They write: "Det finns en spännvidd för hur en given sjukdom påverkar olika individers arbetsförmåga och förmåga att utföra olika aktiviteter. Därför måste bedömningen av arbetsförmågan ske individuellt utifrån individens unika förutsättningar och sysselsättning. En ny bedömning ska ske innan sjukskrivningen

förlängs. Vid utmattningssyndrom i den akuta fasen kan patienten sjukskrivas på heltid eller partiellt upp till 6 månader. Partiell sjukskrivning vid återgång i arbete efter heltidssjukskrivning. Vid utmattningssyndrom med kvarstående kognitiva svårigheter, kan patienten sjukskrivas på heltid upp till 1 år eller mer. Partiell sjukskrivning vid återgång i arbete.” (Socialstyrelsen, 2017a).

Glise’s doctoral dissertation (2014) reviews exhaustion disorder in a primary care setting, with a review of incidence, patient-generated symptomatology, comorbidity, diagnostic criteria and predictors of return to work. To highlight only a few of the findings, patients with exhaustion reported substantial physical complaints. Further, symptom duration before seeking treatment was shown to be a negative prognostic factor for recovery. In a recent radio podd (Sveriges Radio, 2018), Glise posited that individual ED patients are likely to benefit from certain components of multimodal treatment interventions, but maintained that the only evidence-based intervention for return to work after exhaustion disorder is early intervention, including collaboration and detailed planning with the individual’s employer and workplace.

At present there are no Swedish national treatment guidelines for the psychological treatment of exhaustion disorder. Several books have been published suggesting treatment principles (Almén, 2017; Perski, 2012), local healthcare guidelines have been adopted (Västra Götalandsregionen, 2011) and a thus far unpublished treatment manual has for example been in practice in a Swedish primary care clinic for over a decade (Salomonsson, 2018). Treatment regimens for exhaustion disorder hitherto tend to involve sick leave, rest, pharmacotherapy and behavioral interventions (Salomonsson, 2018). Socialstyrelsen’s recommendations (translation by Persson et al., 2016) for sick leave in ED include “psychological support intended to create a balance between activity and rest. Symptomatic treatment focuses on supporting sleep and reducing anxiety. Rehabilitation includes lifestyle change, stress management and the gradual return to a normalized life.” Salomonsson’s dissertation lends support to the efficacy of cognitive behavioral therapy (CBT) protocols in CMD, including ED, both for symptom alleviation and return to work. Earlier meta-analyses on the efficacy of CBT treatment for stress-related symptomatology and psychological treatment for return to work, respectively, have shown conflicting results (Salomonsson, 2018).

Anxiety

Approximately 13% of Swedish sick leave cases lasting more than two weeks were attributed to anxiety disorders (Försäkringskassan, 2017). Anxiety disorders, including generalized anxiety disorder, social phobia, panic disorder, and specific phobia in the DSM-5 nomenclature, are the most prevalent emotional disorder and are therefore characterized as one of the common mental disorders, along with depression, insomnia and stress-related disorders. As a potentially chronic condition with low rates of spontaneous recovery, anxiety disorders compromise quality of life, have an inflated relapse rate and are associated with high direct and indirect cost to society (Försäkringskassan, 2017; Salomonsson, 2018).

In a theoretical framework, anxiety is explained as an individual's response to perceived threat (Frederickson, 2013). The presence of an anxiety disorder implies recurring patterns of perception, physiological and behavioral responses that do not correspond to actual threat stimuli. The evidence base for the treatment of anxiety disorders for adults suggests psychological treatment as a first choice, with the exception of generalized anxiety where pharmacological treatment has proven effective (Socialstyrelsen, 2017b).

Depression

ICD-10 defines depression as a condition where the individual suffers from depressed mood, loss of interest and enjoyment, reduced energy leading to increased fatigability and diminished activity as well as marked tiredness after only slight effort. Other common symptoms are reduced concentration and attention, reduced self-esteem and self-confidence, ideas of guilt and unworthiness, bleak and pessimistic views of the future, ideas or acts of self-harm or suicide, disturbed sleep as well as diminished appetite (World Health Organization, 1992). As another CMD, depression is similarly associated with compromised quality of life, risk of recurrence and societal cost. In contrast to anxiety disorders, spontaneous recovery is often seen in depression. (Salomonsson, 2018). Unfortunately, the relapse rate is estimated to be about 50%. Psychological treatment in combination with pharmacological treatment is at best considered to be effective in 70% of depression cases (Läkemedelsverket, 2016). National Swedish treatment guidelines exist for both anxiety disorders and depression. Psychological treatment for mild and moderate depression is recommended as the treatment of choice. The evidence base includes the efficacy of both CBT, interpersonal therapy (IPT) and psychodynamic therapy (PDT) (Socialstyrelsen, 2017b).

Affect and affect regulation theory

Definition of affects. Humans have long recognized the importance of affects. They are considered central both to human identity and to the experience of self. Affects are also important messengers and guides of needs and desires, both for the individual and as a mean of communication between humans. They have always been central in human practices such as religion, as in the old buddhistic tradition which also includes mindfulness. Posing as an early advocate, Darwin pointed to the important survival value of affects. He delineated seven affects that correspond to distinct facial expressions common to all humans (Hill, 2015). However, to date, neither a shared definition of affects nor agreement to which affects are innate exists. Through his identification of nine primary affects and related theory, Tomkins (1995) has had a great impact on the research field. These primary affects: fear, sadness, anger, shame, dissmell, disgust, surprise, joy and interest, are often referred to within the field of clinical psychology (e.g. Bergsten, 2015; Karterud and Bateman, 2011a & 2011b; Kåver, 2009; Linehan, 2000 Monsen and Monsen, 1999).

Hill (2015) distinguishes between primary affect and secondary, categorical affects. Primary affect is the somatic representation of the state of an organism, i.e. a sensorimotor, physiological representation that generates a felt sense with the two dimensions arousal level and hedonic tone. Categorical, secondary affects are the emotions that have been labelled in language, even though there is still no agreement on which labels and how many there are. The categorical affects are displayed as distinct facial expressions uniform across cultures and are therefore often thought to be so crucial for survival that they have developed into an inherited neurological substrate. They can be hyperaroused such as joy, pride and anger, or hypoaroused, such as sadness, disgust and shame. They have several names for nuances designating their intensity. Hill goes on to formulate that primary and secondary affects constitute an experiential-cognitive appraisal system that alerts the individual to the importance of a stimuli, meaning, motives, needs and desires. Likewise, observed affects in others inform us about their inner states, intentions and meaning. LeDoux (1996) has summarized how the basic affects are mediated by separate neural systems for separate reasons. The emotional responses are primarily generated unconsciously and are thought to have been conserved through the evolutionary process. When the attentional or arousal systems are activated simultaneously, conscious emotional feelings arise. Hence, cognitive assessment alone will not capture the

emotional processes that occur without conscious awareness (Mayer, Naliboff & Munakata, 2000).

The neurobiological foundation of affects and regulation. The vital organs of humans, such as the heart and lungs, as well as the body's metabolism, are regulated by the involuntary autonomic nervous system (ANS). The arousal level in the body is determined either by activation of the sympathetic upregulating aspect of the ANS or by activation of the parasympathetic, downregulating components of the ANS. The ANS is controlled by the limbic system. There is also a neuroendocrine system, the hypothalamic-pituitary-adrenal axis (HPA). The neuroendocrine system consists of a series of glands that up- and downregulate the organism through neurochemical reactions. The limbic system processes information about internal and external environments, and regulates the ANS and the HPA axis that in turn regulates vital organs. Affects represent the arousal level of the vital organs and provide a reading of the state of the self. Mapping the states of the heart is especially important for noticing hyperaroused and hypoaroused states of affect. Also, the states of the lungs and digestive organs transform into somatically based information that signals arousal level of the vital organs. The limbic system integrates information from the body with information coming from the senses, assessing it with the aim of regulating the organism. As Hill puts it: "To regulate affect is to regulate the body". Body-based affect is automatic and often too rapid a process to be consciously processed. Instead, affect is expressed through implicit communication, i.e. facial expression, speech, postures and gestures. There is also an involuntary neurobiological matching which aids in interpreting the subjective experience of others.

Even though rudimentary forms of self-soothing are wired in the infant, the newborn is dependent on the caregiver for affect regulation. The developing capacity to autoregulate affects follows the development of the limbic system. It consists of both an epigenetic unfolding and experience-dependent development with the caregiver, first through touch and other nonverbal communication. With sufficient repetition and consistency, regulating experiences become internalized through neurological ingraining, experiences which with time become automatic psychobiological processes enabling the child to self-regulate. Hence, regulation of the infant's affects first takes place through visceral effects of touch and then increasingly through nonverbal, implicit communication and then finally through verbal communication. With optimal development of the capacity for affect regulation, the individual can alternate

between auto- and dyadic regulation as needed. These patterns are established in attachment relationships. In this model, effectiveness of psychotherapy depends on the experience-dependent plasticity of the brain as well as setting optimal conditions for neural and psychic growth in the therapeutic setting.

The bidirectional communication between limbic regions and viscera has a central role in the generation and expression of emotional response and associated emotions. Various viscera respond to distinct emotion-specific patterns of autonomic output that are fed back to the brain. This happens largely without conscious awareness but is still an important part in emotional function and may influence rational decision making (Mayer, Naliboff & Munakata, 2000). Alterations in this bidirectional process such as peripheral pathologies within the gut or alterations at the brain level, as in exhaustion, may therefore contribute to explain the close links between certain affective disorders and functional visceral syndromes.

An intricate interdependence of feelings, emotions, cognitive functions and visceral sensations has been documented. The experience of affects such as fear and anger are connected to an increased ratio of parasympathetic output to the lower gastrointestinal tract not noted by the individual, in line with the thought that the majority of visceral feedback occurs on a subliminal level. Depression and helplessness might be associated with a reduction in the same ratio. Also, the decision-making process has shown to be influenced by recall of bodily sensations experienced at earlier similar occasions. When awake, human beings see and judge the world using the dual system of rational thinking and gut feelings, while gut feelings dominate the experience of the reality of dreams during REM-sleep, undisturbed by cognitive influences (Mayer, Naliboff & Munakata, 2000).

In contrast to the senses, the majority of interoceptive visceral signals are subliminal, generally not consciously perceived. Normally, visceral sensations are vague states of feelings associated with satiety, hunger, fullness, urgency and relief of urgency. They only enter conscious awareness by associated arousal and can fall below the perceptual threshold if attention is shifted. Thus, there are differences in perception of somatic and visceral signals that are also reflected in differences in the functional neuroanatomy between visceral and somatic afferent pathways, pathways not designed for fast and precise stimulus assessment but for slow sampling of information from general body regions, i.e. not for selective behavioral responses but for stereotypic autonomic responses. In the brain, there are close connections between the regions involved in generation of emotions and the formation of emotional

memory. Hence, the cognitive overload often present in exhaustion as well as physical tiredness of the body puts the individual in a state where many bodily signals are not likely to be heard. If affect regulation, including affect monitoring and labeling, is improved, there should be improved physiological and psychological functioning as well, related to the individual's conscious and unconscious adaptive responsiveness to information from the physical and emotional systems. A caveat in studying this is that the individual might go from a numb and unaware position with regard to signals from the body and mind, forcing the body to a shut down, as in burnout, in order to get the necessary rest by producing severe physiological symptoms and related fear/freeze/flight response. As the capacity to register any signals from the body and mind improves after this forced rest to a new level of awareness, the individual might perceive the actual improvement to be a worsened state.

Studies of affects. Affects are fundamental in many theories over the human mind, reaching over various fields, such as neurobiology and psychology. The research is therefore spread over many areas. Today there is still some disagreement about a common theory over the physiology of affects based on what has been learnt from studies within neurobiology. Bosse, Jonker and Treur (2008) have formalized Damasio's theory of emotions (1994) with its three building blocks founded in neurophysiology. This model describes the physiology of the processes behind affects and how they can be modified. The model consists of affects and their connections to specific reactions and feelings as well as their connection to the experience of the consequences of neural activation and core awareness, the awareness that something has changed as a consequence of stimuli. Affects have always been a central part in the early psychodynamic theory, from Freud's early drive theory with central phenomena such as transference and countertransference to object relations theory and Bowlby's attachment theory (Kernberg, 2006). However, affects have also been shown to have considerable importance even for seemingly rational human decision processes (Björnebekk, 2008; Damasio, 1994; LeDoux, 1996). Monsen and Monsen (1999) have linked theory of affect with therapy within psychotherapy. They explore the connection between mental health problems and awareness of affect, defined as the ability to being aware in experiencing, tolerating, reflecting over and expressing experiences of basic affective activation. Current research focuses on identifying measurements for affect awareness and testing their usefulness and relevance for specific patient groups (e.g. Deckera, Fonagy, Turkb, Hessa & Murraya, 2008; Sloan & Kring, 2007; Solbakken, Sandvik, Hansen, Havik & Monsen, 2011; Wonderlich et al., 2008).

Affect in psychotherapies. A renewed interest for the importance of affects for improving human well-being and treating mental health problems has been seen during the last decades within all major therapy schools: psychodynamic therapy, cognitive behavioral therapy, and interpersonal therapy, not least due to revolutionary research methods within neurobiology. There is also an implicit belief among many clinicians that there is a connection between mental health and improved awareness of affects. This has again brought affect regulation to the forefront as a human resource for psychological well-being. However, to date there are few studies evaluating the relative effect of these therapies with regard to change in affect regulation.

Theories of affect regulation. Being able to regulate affects makes the individual the most adaptively responsive and optimally functioning, and hence also gives optimal access to human resources, such as attention, memory, creativity, reflective ability and flexibility given the specifics of the situation at hand. Conversely, when humans are dysregulated, i.e. no longer in homeostasis, the perception and capacity are narrowed and replaced by scripted versions of self and others. Responses tend to be more automated and reactive (Hill, 2015). Delaney (2006) focuses on how affect regulation and emotional understanding is developed during childhood with a main focus on the large impact of critical events in creating affective regulation abilities. This research is based on Stern's thoughts concerning how representations of interactions become generalized from caretaker-child interactions and thereafter become reactivated in frustrating situations. The focus of attention is regulation problems. Affect regulation is even central in popular concepts such as emotional intelligence. Kafetsios and Zampetakis (2008) define emotional intelligence as the extent to which an individual notices, processes and acts from emotionally founded information, both within the self and in relationship to others. Within the field of personality psychology, Baumann, Kaschel and Kuhl (2007) have found individual differences with regard to affect sensitivity, how quickly one goes in and out of positive and negative affect and affect regulation, here containing self-motivation, the ability to increase own positive affects and self-relaxation, as well as the ability to decrease the experience of negative affects.

Another useful framework is Panksepp's three types of major affect regulation systems with different functions: 1. the threat and self-protection system to detect and respond to threats, e.g. fight, flight, freeze or other coping efforts, which is considered to be the dominating system subordinating the other two to secure survival, giving bursts of emotions such as anxiety, anger

or disgust, 2. the incentive and resource-seeking, drive-excitement system to give positive feelings that guide, motivate and encourage us to seek for resources and 3. the soothing, contentment and the safeness system to bring peacefulness to the self which aids in restoring the internal balance (Gilbert, 2010). These three systems are based on research on emotional processing, research that has revealed a number of integrated circuits in the brain that give rise to different types of emotions that regulate motivation (Panksepp, 1998, in Gilbert 2010). The threat system is likely to have been activated in many cases during exhaustion. This deactivates the safety and drive systems, and therefore has to be moderated both through reassessing the danger and by increasing emotional security in order to facilitate recovery.

Affect regulation theory. Hill (2015) goes one step further and attempts to create a coherent clinical model of affect regulation theory. The model includes an integration of attachment therapy, developmental affective neurobiology, developmental social-cognitive neurobiology, emotional studies, mother-infant studies and developmental psychoanalysis. In his theory, Hill integrates Schore's regulation theory with mentalization theory developed by Fonagy et al. (2002). Schore's theory focuses on the primary affect regulation system, i.e. the early automatic nonconscious psychoneurobiological processes. Mentalization theory by Fonagy et al. focuses on what Hill calls the secondary affect regulation system, the latter forming verbal, reflective, slow, deliberate and conscious cognitive processes.

Correspondingly, Hill differentiates between first-order change, which relates to the tendencies, states and affects that one is reflecting on, i.e. the initial changes in primary affect regulation, including implicit, automatic expectations and associated feelings, from second-order therapeutic change in self-reflective capacity, i.e. insight, self-awareness, self-knowledge, which gives the potential of effective secondary left-brain mentalizing. It is through affect synchronicity with a therapist that positive affect and interactive repair that modulates negative affect takes place. Schore and Hill also stress the importance of nonverbal communication, unconscious processes and attentiveness in therapy to convey affects. From an interpersonal neurobiological perspective, Hill asserts that left-brain secondary processing, i.e. linear, conscious and verbal functions, is dominant during moderate levels of arousal to process familiar information and navigate predictable events. This is contrasted with right brain, holistic, nonconscious, nonverbal primary processing, which is dominant in intense, heightened or reduced levels of arousal, and activated when processing novel events and stressful emotional information. As Schore mentions in Hill, in a hyperaroused enactment, the

therapeutic situation must downregulate, and in a hypoaroused enactment, emotional energy must be infused. This could also be compared to the conditions under stress reaction, hyperarousal, and the following exhaustion, hypoarousal.

The window of tolerance. There are individual differences in the range of arousal levels that one can tolerate without becoming dysregulated and losing functionality. Hyperaroused and hypoaroused respectively mark the top and the bottom of the individual's boundaries of affect tolerance, which Hill refers to as the windows of tolerance. The aim of affect regulation therapy is to extend the tolerance of affect by extending the window at its edges. Important dimensions of affect regulation according to Hill (2015) are tolerance for affect, which is linked to the capacity to modulate the intensity of affect, and affective resilience which is defined as the capacity to recover functioning after exposure to stress-induced dysregulation, a daily condition of normal human existence. Deficiencies in these three areas: affect tolerance, modulation and resilience are thought to be manifested as psychiatric symptomatology (Hill, 2015). Capacities and deficiencies for affect regulation tend to be passed on in the caregiver-infant interaction and are manifested in attachment relationships. Therefore, the therapeutic relationship needs a stable, regulating and vitalizing emotional connection to create conditions for improving affect regulation. The therapeutic relationship also consists of unconscious processes that compare to the early right brain social-emotional development mediated through sufficient caregiver-infant interactions (Hill, 2015).

Therapy for developing affect regulation. Both CBT and PDT have developed specific therapy forms that are centered around affects and improving dimensions of affect regulation. Panksepp's 3 types of major affect-regulation systems with different functions are cornerstones within Compassion Focused Therapy (CFT) (Gilbert, 2010), which belongs under the CBT umbrella. DBT, also belonging to CBT, as well as transference focused therapy (TFP) and mentalization based therapy (MBT), both of which belong to PDT, have been developed for patients with borderline personality syndrome and focus through somewhat different processes on improving affect regulation, a key issue for this patient group (Linehan, 2000; Karterud & Bateman, 2011a samt 2011b; Rydén & Wallroth, 2008). Based on modern research in neurobiology and modern attachment theory, Schore and Schore (2008) describe the central role affect regulation has for the development of self, affective patterns and therapeutic treatment, hence bridging recent findings in neuroscience with a theory of affect regulation and its therapeutic implications. They have named their theory regulation theory to mark the

importance of affective attachment processes that the primary object, i.e. the caregiver, helps the child with to mature parts in the brain that are important for affect regulation. These are later important for resilience under stressful situations. In Schore's regulation therapy, patients are thought to get efficient treatment through the unconscious transference-countertransference process that takes place with an empathic therapist, who also can regulate the arousal in the client. The renaming of Schore's theory marks the implicit nonconscious change processes, notably the rapid, nonconscious hidden mechanisms beyond words, i.e. how right brain implicit nonverbal processes become explicit, processes that according to Schore lie at the core of the therapeutic relationship (Schore in Hill, 2015).

Affect regulation, stress and exhaustion

Stress and core executive functions. Stress can be divided into various forms that have unique effects on core executive functions. Acute stress refers to a recent transient occurrence of a single stressor. Chronic stress refers to an ongoing difficulty that may be a constant threat or presence in an individual's life. Stress works through multiple biological processes, aside from or in addition to the hormone cortisol. Due to ethical concerns, a greater number of studies have been conducted demonstrating the effects of various manipulations on acute stress. Core executive function, i.e. the higher cognitive processes that enable planning, forethought and goal-directed action, can be impaired by acute stress. Three important dimensions of executive function are 1. working memory – the ability to keep information in mind and integrate/update current contents with new information, 2. inhibition - the ability to inhibit thoughts or responses in order to selectively attend to relevant information and engage in goal-directed actions and 3. cognitive flexibility – the ability to shift flexibly between cognitive rules or modes of thought.

Effects of acute stress on core executive function. A meta-study by Shields, Sazma & Yonelinas (2016) sheds light on how acute stress in some situations impairs cognition, yet in others benefits cognitive processes. The study found that acute stress impaired working memory, even worsening over time, cognitive flexibility and cognitive inhibition whereas acute stress enhanced response inhibition. Stress seems to bias cognition to process information that is most related to the current stressor, by partially funneling cognitive resources to selective attention, i.e. enhanced response inhibition and impaired cognitive inhibition. Stress contributes to a cognitive state of reactive and automatic processing as well as enhanced executive motor control, thus facilitating engagement with or escape from the current stressor. Stress thus shifts higher cognitive processing to facilitate both engagement with and/or avoidance of the current

stressor, i.e. fight or flight. By impairing executive control of cognition, i.e. thoughts and thinking, stress contributes to a reactive cognitive state that is fine-tuned to rapidly force attention to highly salient, stressor-related information, while leaving executive control of motor actions, i.e. response inhibition, intact, producing a state of enhanced control over actions for fleeing from or fighting a current stressor (Shields, Sazma & Yonelinas, 2016). This can explain the large discrepancy in cognitive versus motor functioning at least in the earlier phases before the body reaches exhaustion.

Chronic occupational stress on cognitive and emotional function. Golkar and colleagues (2014) used functional MRI to study the effect of chronic occupational stress on cognitive and emotional function. Forty patients with burnout classified by the Maslach Stress-Burnout Inventory and with the ICD-10 diagnosis F43 reaction to severe stress, were matched with healthy controls. All participants completed questionnaires of psychological well-being, gave saliva samples and participated in f-MRI scanning. Golkar and colleagues found significant changes in amygdala and prefrontal cortex connectivity in the patient group. Patients showed difficulties in down-regulating negative emotion. The authors relate these difficulties to altered limbic networks associated with chronic stress. Persson and colleagues (2016) similarly reported that neuroticism was associated with ED symptomatology on the Lund University Checklist for Incipient Exhaustion (LUCIE). The authors speculate on the cause and effect mechanisms involved, i.e. whether the personality dimension of neuroticism is associated with at greater risk of exhaustion or whether exhaustion symptoms reduce the capacity for the regulation of negative affect. They also suggest further investigation of subgroups within personality dimensions and posit perfectionism as an aspect for future inquiry. Examples of international studies aimed at reduction of symptoms of stress and job burnout have shown positive results. After eight sessions of mindfulness based cognitive therapy for Iranian cardiac nurses with burnout, Motaghedi, Donyavi, and Mirzaian (2016) reported increased distress tolerance as measured by the Distress Tolerance Scale (DTS). Ebert, Lehr, Riper, Cuijpers, and Berking (2016) showed a significant effect of internet- and mobile phone-based stress management on perceived stress, emotion regulation, emotional exhaustion, sleep quality, and symptoms of depression and anxiety in a group of employees with elevated levels of self-reported stress. Changes in emotion regulation (Motaghedi et al., 2016) and reduced suppression (Bassal, 2016; Yin, Huang & Wang, 2016) are postulated change mechanisms.

Aims

Schore's regulation theory (Hill, 2015; Schore and Schore, 2008) posits that regulation of affect is fundamental for optimal functioning and that the mechanisms of affect regulation are the primary targets for therapy. So far, there seems to be no study that has demonstrated the relationship between affect regulation and treatment results with regard to exhaustion disorder. This study aims to investigate if there is a connection between symptom reduction of exhaustion disorder and improved affect regulation. A working hypothesis was that patients showing signs of recovery from exhaustion would also show signs of improved affect regulation.

Methods

Ethics

Ethical approval for this study was given according to the terms applicable to student theses at the Department of Psychology at Lund University. Following Beauchamp and Childress' (2001) guiding principles, the study procedure was considered from the perspectives of doing no harm, being beneficial as well as respecting autonomy and justice. Study participation, which entailed therapy and the completion of three questionnaires on three occasions, was deemed to be without risk or long-term ill effects for the patient group. As exhaustion is a significant reason for sick leave and the questionnaire results were of clinical use, the research project was motivated both from a patient and research perspective. Treatment course was not affected by optional study participation, and all patients meeting the diagnostic criteria for exhaustion were informed of the study, regardless of comorbidity.

Participants

Patients were recruited from both authors' private practices in southern Sweden. Both authors are licensed clinical psychologists in Sweden and are currently studying for a higher degree in psychotherapy (psykoterapeutprogrammet). All patients meeting criteria for exhaustion disorder according to NBHW criteria were informed of the study. Every patient that was approached accepted to participate and, upon giving informed written consent, patients were subsequently included in the study. Treatment was standardized according to the terms specified by Vårdval Psykoterapi, i.e. 6-14 CBT-based (11 participants) or PDT/IPT-based (15 participants) treatment sessions.

Procedure

Patients completed the battery of questionnaires specified below at the start of treatment (PRE), at the end of treatment (POST) and at the three-month follow-up (3). All patients participating in Vårdval Psykoterapi complete Region Skåne's questionnaires at these intervals. For the purposes of this study, participants completed three extra questionnaires.

Instruments:

The Hospital Anxiety and Depression Scale (HADS) (Zigmond & Snaith, 1983) measures self-reported anxiety with 7 items and depression with 7 items on a Likert scale corresponding to 0 = no symptoms/difficulties to 3 = severe/frequent symptoms/difficulties with a clinical cut-off level of 10 for each scale (Zigmond & Snaith, 1983). The authors used correlation measures between test- and retest scores, as well as correlations between psychiatric evaluation and self-report scores, to determine test properties such as reliability and specificity. The original article does not report measures of internal consistency. First developed for use in a hospital setting, HADS has subsequently been translated into many languages and adapted for use in for example primary care and research settings. A vast number of articles have since been published describing the satisfactory statistical properties of the scale (e.g. Lisspers, Nygren & Söderman, 1997).

The Karolinska Exhaustion Disorder Scale (KEDS) (Besèr et al., 2014) consists of 9 items related to the Swedish diagnostic criteria for exhaustion disorder. Items are rated on a scale corresponding to 0 = no symptoms to 6 = severe symptoms. The authors suggest a threshold value of 19 for clinically relevant symptoms of exhaustion (Besèr et al., 2014). In Besèr's article describing the construction and evaluation of KEDS, satisfactory sensitivity (94-97%) and specificity (95-98%) are reported. Internal consistency was found to be acceptable (Cronbach's alpha = 0.94).

The Difficulties in Emotion Regulation Scale (DERS) (Gratz & Roemer, 2004) measures affect regulation and consists of 36 items rated on a Likert scale 1 = almost never to 5 = almost always, with a suggested cutoff value of 80 for all items. Internal consistency for the scale was reported as high (Cronbach's alpha = .93). The authors delineate six subscales, namely nonacceptance, goals, impulse, awareness, strategies and clarity, all of which similarly had adequate internal consistency (Cronbach's alpha >.80 for each scale). DERS was translated into Swedish by Friberg, a Master's student in psychology (described in Olsson, 2010). Friberg's Swedish version of DERS showed an internal consistency matching Gratz and

Roemer's. The Swedish DERS has used in both its original length and, recently, in an abbreviated format (Bjureberg, 2018).

Treatment

Patients were all referred for brief psychotherapy as stipulated by the referring doctor and the regional healthcare regimen (kort behandling inom Vårdval Psykoterapi). The limited time frame was common to all patients, but one of the therapists (JR) chose a CBT or PDT/IPT protocol as deemed appropriate for each patient. A case formulation was made for each patient, and an individualized treatment plan was formulated in collaboration with the patient on the basis of his/her chief complaints. Comorbidity, such as anxiety and depression, was assessed and addressed as necessary and feasible within the limited treatment frame. The main treatment objective for exhaustion was symptom reduction, rest and exercise as well as relapse prevention, including learning to listen to various bodily sensations: fatigue, stress level but also emotions and corresponding needs. In the case of CBT treatment, key behavioral and cognitive reinforcers were identified and, where possible, new behaviors were practiced. In the case of PDT/IPT treatment, voicing needs, emotions and boundaries to the social network were encouraged. If indicated, recommendations for complete or partial sick leave and assessment requests of antidepressant, anxiolytic or sleep medication were communicated to the referring doctor.

Data analysis

Data analysis was performed with Microsoft Excel and IBM SPSS Statistics 24. An initial analysis of descriptive characteristics for the sample was performed. Internal consistency (Cronbach's alpha) for the three instruments was assessed for pre-, post- and three-month intervals. Thereafter, possible correlations between the scales were calculated using Pearson correlations. One-sample t-tests were executed for pre- to post-treatment changes of the three self-report questionnaires. Effect size was calculated for pre-treatment scores in relation to post- and three-month values respectively. Independent samples t-tests were performed to compare symptom load between those patients with first-time exhaustion with those with recurrent exhaustion. Independent samples t-tests were also used to compare DERS affect regulations scores between those patients who showed improvement on symptoms of exhaustion with those with a decline in stress symptoms on KEDS. For patients with complete data at all three measurements (n=16), each individual's scores were compiled and viewed to detect possible patterns or mediating factors.

Results

Descriptive statistics

At the time of data analysis, 29 patients had been included in the study. Because their respective courses of treatment were still in progress when data analysis began, three patients lacked post-treatment data and were therefore excluded from further analysis. Hence, 26 patients with data at two data points were included for data analysis, End of treatment data was missing in 3 cases (11.5%), and three-month data was missing in 7 cases (26.9%), leaving 16 patients (61.5%) with complete data, five participants who received CBT with CDB and 11 participants who received CBT or PDT/IPT with JR. The reason for lack of data in 10 cases was solely due to administrative reasons; no participant dropped out from treatment. Of the final 26 patients, 23 were females (80,5%). The mean age was 40; the oldest patient was born in 1958 and the youngest in 1995. For just over 40% (11 patients) of the sample, this was not their first episode of exhaustion. Twenty-three of the patients were born in Sweden. The three patients who were raised in other countries had moved to Sweden five to 40 years ago. All participants were fluent in Swedish. Seventeen of 26 patients (65%) were married or cohabiting with a partner. 54% of the sample had a higher educational degree, i.e. the majority of the sample had a post-high school educational level.

Scale reliability

The included scales HADS, DERS and KEDS had sufficient reliability (see Table 1).

Table 1. Test of reliability with Cronbach's alfa based on standardized means at pre, post and three-month follow-up measurements for the scales HADS, KEDS and DERS

	Cronbachs alfa	Cronbachs alfa*	Items	N
PRE HADS	0.798	0.802	14	25
POST HADS	0.888	0.894	14	23
3 HADS	0.917	0.918	14	18
PRE KEDS	0.779	0.804	9	26
POST KEDS	0.857	0.86	9	23
3 KEDS	0.898	0.902	9	19
PRE DERS	0.918	0.919	36	26
POST DERS	0.942	0.939	36	24
3 DERS	0.952	0.953	36	18

**Based on standardized means*

Correlations

The questionnaires HADS, KEDS and DERS were significantly intercorrelated, as Table 2 displays. In the following, HADS Å and HADS D denote the respective anxiety and depression measures of HADS.

Table 2. Pearson correlations among the outcome scales DERS, KEDS and HADS (split into depression and anxiety) at pre, post and three-month follow-up measurements

	PRE DERS	PRE KEDS	PRE HADS Å	PRE HADS D	POST DERS	POST KEDS	POST HADS Å	POST HADS D	3 DERS	3 KEDS	3 HADS Å	3 HADS D
PRE DERS												
PRE KEDS	NS: 0.22											
PRE HADS Å	NS: 0.313	NS: 0.123										
PRE HADS D	0.718**	NS: 0.13	NS:0.063									
POST DERS	0.546**	NS:0.256	NS:0.201	NS:0.225								
POST KEDS	NS:0.042	0.542**	NS:0.214	NS:0.171	0.564**							
POST HADS Å	NS: 0.289	NS: 0.22	0.542**	NS: 0.144	0.615**	0.757**						
POST HADS D	0.57**	NS: 0.074	NS:0.398	0.451*	0.708**	0.483*	0.597**					
3 DERS	NS: 0.358	NS:0.038	NS:0.183	NS: 0.135	0.644**	0.563*	0.589*	0.565*				
3 KEDS	NS:-0.021	NS: 0.397	NS:-0.31	NS:-0.083	NS:0.012	0.588*	NS: 0.296	NS:0.012	0.603**			
3 HADS Å	NS:0.073	NS:0.239	0.479*	NS:-0.139	NS:0.166	0.562*	0.612*	NS: 0.227	0.72**	0.753**		
3 HADS D	NS:0.331	NS:0.085	NS:0.120	NS: 0.328	0.55*	NS: 0.362	NS: 0.363	0.719**	0.802**	0.575*	0.556*	

*P<0.05. **P<0.01.

All scales correlated with themselves PRE and POST as well as POST and at three-month follow-up. PRE DERS correlated with PRE and POST HADS D. POST DERS correlated with HADS D at the three-month follow-up. All scales correlated with the other scales POST and at three-month follow-up. POST KEDS correlated with the other scales at three-month follow-up, with the exception of HADS D. All POST scales correlated with DERS at the three-month follow-up.

Pre- to post treatment changes

The patients showed significant improvement in all three measures of self-rated health at pre-, post- and three-month measures. Figure 1 shows mean values for the scales DERS and KEDS. Effect sizes were consistently moderate to large, for pre- to post- and pre- to 3-month comparisons respectively. The questionnaires gave the following effect sizes: DERS (0.66 / 0.74), for KEDS (0.72 / 0.74), for HADS depression (0.55 / 0.83) and for HADS anxiety (0.68 / 0.71). At the start of treatment, the group mean (M 12.68, SD 3.84) suggests clinical levels of anxiety on HADS, but subclinical depression (M 9.12, SD 4.96). Mean anxiety and depression reflected non-clinical levels at both post-treatment measurements. Several patients reported antidepressant use, but usage of antidepressant or other psychotropic medication was not systematically recorded. Emotion regulation means in the sample were above the cutoff at all three intervals. The sample's level of stress symptoms on KEDS at the start of treatment corresponded to moderate levels of exhaustion (interval for moderate exhaustion 27-36 points). Those patients with an earlier history of exhaustion disorder reported significantly more cognitive and physical stress symptoms on KEDS (M = 31.38, SD = 7.25), $t(17) = -2.44$, $p = 0.26$ and anxiety (M = 12.71, SD = 4.19), $t(16) = -2.46$, $p = 0.26$ at the three-month follow-up compared to first-occurrence patients (3 KEDS M = 21.91, SD = 9.02); 3 HADS anxiety M = 8.0, SD = 4.72).

Figure 1. Means of the scales DERS and KEDS at pre-, post- and three-month follow-up. Changes with one-sample t-tests are significant with $p = .000$ at each interval.



Subgroup analysis

Patients' KEDS scores were divided into three groups: those who showed an improvement of scores between pre- and post- measures, those who showed impaired scores at the end of treatment and those whose scores were unchanged or within a one-point difference. Though an independent samples t-test yielded nonsignificant results between patients with alleviated KEDS stress symptoms on the effect of affect regulation (POST DERS M = 84.3, SD = 28.6; 3 DERS M = 79.8, SD = 28.7) compared to patients with an increase in KEDS scores, (POST DERS M = 94.4, SD = 9.1; 3 DERS M = 84, SD = 8.83) on post- $t(16) = -.761$, $p = 0.458$ and 3 KEDS $t(12) = -.281$, $p = 0.783$ measures, each participant's scores were examined to discern possible mediation relationships, i.e. improvements in KEDS and DERS between PRE and POST measurements and possible related effects on the three-month follow-up of the other scale.

The following bidirectional observations were made: 10 of the 16 participants showed signs of mediation for both DERS and KEDS, of which only three participants showed this effect for both scales i.e. overlapping findings. Five of the 10 participants who showed lower POST DERS, i.e. improved affect regulation, had lower 3 KEDS, i.e. less severe exhaustion symptoms, at the three-month follow-up. Seven of the 10 participants who showed lower POST KEDS, i.e. less exhaustion symptoms, had lower 3 DERS, i.e. improved affect regulation, at the three-month follow-up.

Discussion

Overall findings. Study participants showed significant symptom reduction on all measures of self-reported exhaustion symptoms, anxiety, depression and emotion regulation. Effect sizes were all in the moderate range, with the exception of a large effect size for the difference between pre-treatment and three-month depression scores. The three outcome questionnaires were significantly intercorrelated. The possibility of an intricate interdependence between feelings, emotions, cognitive function and visceral sensations on a subliminal level helps explain the close connection between emotions and other psychological symptoms often present in exhaustion such as fear and anger, anxiety, depression, sleep disturbances and deteriorated decision-making (Mayer, Naliboff & Munakata, 2000). The specific contribution of psychological treatment is not assessed within the realm of this study since there was no control group, but the findings corroborate both spontaneous recovery from ED over time and the efficacy of psychological treatment for common mental disorders.

Treatment aims were in the spirit of Socialstyrelsen's principles for determination of sick leave for ED (in Persson, 2016): to enhance the patient's individual capacity to identify affect and emotional needs, to learn to set effective and assertive limits for personal engagement and lastly to facilitate sleep and relaxation technique as well as regular exercise.

Consequences of exhaustion. Interestingly, the patient sample of this study showed deficits in emotion regulation at the start of treatment as defined by Gratz och Roemer's (2004) cutoff value. The study by Golkar and colleagues (2014) gives evidence of impaired emotion regulation in a group of patients with exhaustion disorder, which would give reason to believe that the same would apply in the present study. The clinical experience of the therapists in this study concurs. When discussing emotions and reactions to emotions, many patients with ED find it difficult to articulate and formulate their feelings and their strategies for expressing, regulating or just plain dealing with their emotions and symptoms. Though not explicitly assessed in the present study, exhaustion disorder entails exceeding one's physical and emotional capacity over an extended period of time, compromising sleep and/or relaxation and neglecting basic emotional needs.

Disconnection between body and mind. The bidirectional data of this study support the thought that there can be many reasons for impaired affect regulation and exhaustion, such as inattentiveness to the body's need of rest compromising an individual's conscious and unconscious adaptive responsiveness to information from the physical and emotional systems. Some individuals might not have developed the capacity for effective affect regulation in infancy and are therefore unable to sufficiently register and process body signals. Some, due to stress-invoked brain alterations (Golkar et al., 2014; Shields, Sazma & Yonelinas, 2016) and fatigue, might not hear or not register or not remember cues from the body which in turn might cause them to not react adaptively to overactivity. Many researchers and professionals also suspect that extensive levels of stress hormones in the body over a prolonged time period can lead to damage in brain areas (Golkar et al, 2014; Shields, Sazma & Yonelinas, 2016) such as the limbic system, neurotransmitters, immune system or elsewhere, making it difficult for patients to both unconsciously and consciously hear and trace their level of arousal or fatigue over time as well as their emotions, even for those who had this capacity before developing exhaustion disorder. Others, due to personality traits such as neuroticism or values such as perfectionism, might have difficulties prioritizing their wellbeing (Persson et al., 2016).

The ambiguous nature of stress. Many of the participants displayed a poker face, showing no traces of fatigue in their appearance, making it difficult for doctors, employers, even close family and psychotherapists, to see objective signs of exhaustion. Instead, the patients presented somatic symptoms such as dizziness, panic attacks, social avoidance, muscle ache, stomach complaints, intestinal inflammations etc. They had also often previously received medical examinations for their symptoms. This lack of visible facial signs of exhaustion increases the risk of delay before adequate diagnosis and intervention, i.e. adjusting life demands and reducing activity level accordingly. As Hill (2015) writes, individuals who are dysregulated, i.e. as in exhaustion, rely more on scripted versions of self and others and use automated and reactive responses to a greater degree. This can also explain why persons with exhaustion often continue to be physically active beyond what is healthy for them. As previously mentioned, stress functions through multiple biological processes and has shown to have effects on core executive functions necessary for deliberate planning and goal-directed behaviour. The meta-study by Shields, Sazma & Yonelina (2016) explains the large discrepancy between cognitive and motor functioning found in patients with exhaustion disorder. This discrepancy is created when the body aims to preserve the life supporting acute fight and flight mode aimed towards the current stressor through selective attention by reactive and automatic processing. This phenomenon could be noticed among the exhausted participants in this study that at least in the beginning had difficulties restraining daily activity levels, leading to further accentuation of the cumulative stress symptoms.

Primary and secondary affect regulation. The distinction between primary and secondary affect regulation deserves comment. In treatment, clinicians intend to mirror, provide positive examples of and teach affect regulation in a meaningful way, examples as such of primary affect regulation. Efforts to teach patients about and encourage skill building in affect regulation, fulfilment of their emotional needs, improvement in their regulation of for example rest and activity correspond to secondary affect regulation processes. Hill's (2015) clinical model of affect regulation theory can help explain beneficial effects of therapy that may have been present in this study. The model differentiates between first-order change, i.e. the initial changes in primary affect regulation, including implicit, automatic expectations and associated feelings, from second-order therapeutic change in self-reflective capacity, i.e. insight, self-awareness, self-knowledge, which gives the potential of effective secondary left-brain mentalizing. The model implicates therapeutic work to start with nonverbal holding and

reassuring through the primary, automatic, nonconscious affect regulation system as in Schore's regulation theory (Hill, 2015). After sufficient patient recovery, psychotherapeutic treatment then engages in verbal, cognitive interventions improving mentalization and perspective taking, which in turn facilitates integration of learning and lasting behaviour change, as such examples of the secondary affect regulation system as in Fonagy et al. (2002). The distinction between first- and second-order change and resulting treatment progression is supported by research, e.g. Damasio (1994), Hill (2015), Mayer, Naliboff & Munakata, (2000), and is a central tenet in AEDP-therapy (Fosha, 2000; Prenz & Fosha 2017).

Therapy in the brain. In burnout, the right brain with nonconscious primary processing is likely to dominate due to either intense heightened levels of arousal due to stress or reduced levels of arousal due to fatigue. The right brain is activated when processing novel events and stressful emotional information, making the therapeutic task either to downregulate when the patient is in an hyperaroused state or upregulate by infusing energy with a patient in a hypoaroused state (Hill, 2015). It is affect synchronicity with a therapist who soothes/downregulates negative affect and facilitates positive affect that creates conditions for interactive repair (Hill, 2015). In therapy, the central mechanisms of timing and dosage of interventions come into play. In the early phase soothing, comfort and awareness might be more beneficial. In a later phase of treatment, a gradual shift to verbalization and conscious reflection, with an increased focus on cognitive content, can be of therapeutic value.

Affect tolerance with therapy. In line with the theories of Hill (2015) and Schore and Schore (2008), the aim of the therapies in the study was also to extend the participants' window of affect tolerance, both by expanding the tolerance for affect through improving the capacity to modulate the intensity of affect including stress management techniques, and by improving affective resilience, the capacity to recover functioning after exposure to stress-related dysregulation. In the psychodynamic therapies, this was done by first focusing on unconscious implicit nonverbal change processes including transference-countertransference processes that takes place with the therapist who attempts to regulate the arousal in the participant (Schore in Hill, 2015).

Therapeutic interventions. In line with Hill's reasoning (2015), therapies such as in this study that assist the patients in developing routines that via vital organs consciously monitor their tiredness level before engaging in more strenuous activities could lead to faster recovery by halting further potential damage through overactivity. As Glise (2014) reported in

her dissertation, symptom duration before diagnosis in patients with exhaustion disorder was a negative prognostic factor for recovery. Therefore, interventions in this study included increasing the participants' self-monitoring ability, starting with regular observations of fatigue and sleepiness, as well as moment-to-moment stress level in their daily lives, for example by monitoring heart rate and pulse and thereafter communicating these observations to their surroundings. As a side remark, this could also explain why bodily focused techniques such as mindfulness, relaxation, yoga etc. were experienced as helpful in the present sample. As Motaghedi et al (2016) showed, interventions for burnout using mindfulness based cognitive therapy did indeed improve distress tolerance. Physical techniques might contribute to shortening recovery time and stalling the development of further stress symptoms, developing conscious affect regulation and recovering the decreased ability to regulate affect in individuals who had this capacity before developing exhaustion disorder.

Cognitive impairment. When treating patients with exhaustion, clinical experience in this study showed that patients' cognitive deficits made it necessary to adapt treatment sessions and planning. A 45-minute session can be too taxing for individuals suffering from exhaustion. Offering psychoeducation, posing socratic questions or questions aiming at for example cognitive restructuring can be strenuous for patients. Accordingly, it would be reasonable to assume that, for a patient with exhaustion disorder, the window of affect tolerance also would be compromised. No systematic measures thereof were made in this study, but affect tolerance would be a relevant measure to consider in future work.

Mediation. The vague implication that changes in level of exhaustion per se possibly could mediate affect regulation and hence influence the ability to regulate affect can be connected to the importance of the largely unconscious bidirectional communication between limbic regions and viscera for generation and expression of emotional response and associated emotions (Mayer, Naliboff & Munakatas, 2000). These non-significant findings in a very limited sample must be treated with caution but deserve to be mentioned with the aim of inspiring further research. These implications could also support the reasoning that as affect regulation is improved, either with therapy or by natural recovery, there should be improved physiological and psychological functioning as well, related to the individual's conscious and unconscious adaptive responsiveness to information from both the physical and emotional systems. In line with Panksepp's theory (Gilbert, 2010), a body that is deregulated assumingly sends at least unconscious fear signals to the brain. Given that this system is subordinated the

soothing, contentment and the safeness system that could have brought peacefulness and contentment with rest, the individual with exhaustion does not get aid from this system in restoring internal balance. Therefore, therapy can, by being reassuring and supportive in nature, help the individual reassess danger and instead facilitate feelings of emotional security that in turn can facilitate recovery. While further research is needed, the multidirectional, non-significant, and hence ambiguous findings of this study when it comes to mediation, can possibly support the reasoning that as the capacity to register any signals from the body and mind improves after a more or less forced rest to a new level of awareness, the individual might perceive the actual improvement to be a worsened state. The many patients who at post-evaluation sessions spontaneously question their pre-evaluations and related ability before entering treatment support this notion.

Weaknesses of the study include the limited number of participants and the administrative errors leading to fewer participants with complete data sets, both of which have implications for generalizability and data power. All patients referred to the respective practices with symptoms of exhaustion were consecutively approached for inclusion, and all patients consented to participate. The lack of control group to assess the effect of spontaneous recovery is a further limitation. Nonetheless, effect sizes for outcome measures were in the moderate to large range. Because there was no specified treatment manual other than published guidelines and because our practices have a restricted patient capacity, comparisons of the relative effects of the therapists and/or therapy forms was not considered to be viable.

The sample was predominantly female, as is the case in the respective clinical practices. Women have a higher rate of sick leave in Sweden (Försäkringskassan, 2017), and are also more likely to seek psychological counselling (Salomonsson, 2018). However, given the disproportion of referrals for clients of female gender relative to the gender similarities in symptom load and course of illness in ED (Glise, 2014), further analysis of factors involved in the referral process for psychotherapy would be welcome. The current sample has an above-average educational level for Sweden (www.ekonomifakta.se). Both of the authors' practices are located in socioeconomically privileged areas, and the educational levels in the sample could reflect this fact but also mirror a similar finding in Glise's material (2014).

Ethical considerations in this study involve the extra cognitive load that the completion of the questionnaires may have incurred. Patients did occasionally comment that the questionnaires were tiring, but several also found value in the learning process about

themselves that the questions generated. Patients were given written information about the study and were informed that they were free to refrain from further participation at any time. Treatment protocol was not influenced or modified in any way by study participation. In several instances however, patient responses from questionnaires were used as a complementary instrument for treatment planning and case formulation.

Future research. It would be interesting to see future studies documenting the relative effect of specific components and their timing, such as affect tolerance, modulation and resilience (Hill, 2015), potentially also the relative importance of the therapeutic relationship, therapeutic alliance and attachment patterns. More specifically, it would be interesting to see if the therapeutic relationship even can prove to mature brain features that are important for affect regulation, including resilience (Schore and Schore, 2008). Other interesting measures to consider in future studies are treatment expectations on treatment outcome, possible relationships between symptom load, sick leave length, impact of contact with the workplace, work satisfaction, manager supportiveness and the possibility of influencing pace of return to work. As mentioned earlier, an alternative explanation for symptom reduction is the healing power of time on stress-related disorders. Hence, future studies should include a control group to correct for and assess the impact of spontaneous recovery. A full recovery for patients during a short psychotherapeutic contact cannot be expected since the mean recovery time for patients with burnout is often long (Försäkringskassan, 2017; Glise, 2014). In fact, the mean KEDS score in the present sample at the end of treatment, as well as at the three-month follow up, still corresponded to moderate levels of exhaustion disorder. Also, it stands to reason that treatment outcome for an individual patient receiving care from different healthcare providers is a result of many factors. One primary factor is the treating physician's individual assessment of the necessity for rest, i.e. expectations for recovery time and procedures for sick leave, both of which vary substantially and have shown to be a potentially significant source of frustration (Persson et al., 2016). The research community, healthcare providers and patients alike would benefit from further systematic outcome studies of psychological treatment for exhaustion disorder, early intervention at symptom debut, joint treatment strategies for all parties working with and for patients and, above all, consensus on evidence-based treatment guidelines for exhaustion disorder.

Conclusion. At a psychological level, the results suggest that there is indeed a connection between emotion regulation and exhaustion. Though causality cannot be inferred,

the implication could be that enhancing an individual's capacity for healthy emotion regulation could be a salutogenic factor for stress management. And as Benjamin Franklin once said (albeit of fire safety): an ounce of prevention is worth a pound of cure.

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