Reflections on Work-Related Stress Among Intensive Care Professionals: An Historical Impression

M. M. C. van Mol, E. J. O. Kompanje, and J. Bakker

Introduction

Medical doctors have experienced significant changes in the delivery of healthcare over time. Long and tense working hours, increased administrative burden, impaired work-life balance, and frequent burden of liability and lawsuits have changed daily practice [1]. In addition, increased expectations from patients and families and a complex process of shared decision-making, lead to severe stress in health care providers [2]. This work-related stress can have a negative impact on an individual’s joy in work, increase the chances of medical errors, and jeopardize quality of care [3, 4]. It might even result in long-term absenteeism or a threatening brain and skill drain if the professionals leave their jobs prematurely to preserve their own health, ultimately leading to economic burdens [5]. Reports have indicated that this increased work-related stress may cause suicide among doctors [6].

Physicians appear to be more likely to die by suicide than other health care professionals and twice as likely compared to the general population, although, it is still quite a rare occurrence. Each year, approximately 400 physicians in the USA die by suicide, which is more than by motor vehicle, drowning, homicide, and plane crashes together [7]. Historically, various health care professionals have been acknowledged as particularly vulnerable to work-related stress, with a number of

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Table 1 Types of stress responses experienced by healthcare professionals

<table>
<thead>
<tr>
<th>Anxiety</th>
<th>Moral distress</th>
</tr>
</thead>
<tbody>
<tr>
<td>Burnout</td>
<td>Post-traumatic stress</td>
</tr>
<tr>
<td>Compassion fatigue</td>
<td>Secondary traumatic stress</td>
</tr>
<tr>
<td>Countertransference</td>
<td>Secondary victimization</td>
</tr>
<tr>
<td>Depression</td>
<td>Substance abuse</td>
</tr>
<tr>
<td>Empathic distress/strain/fatigue/overload</td>
<td>Suicide</td>
</tr>
<tr>
<td>Emotional distress</td>
<td>Vicarious trauma/stress</td>
</tr>
<tr>
<td>Exhaustion</td>
<td>Wounded healer</td>
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</table>

prevalent stress responses such as burnout, compassion fatigue, and traumatic stress (see Table 1 for an overview).

A 2014 study on the prevalence of burnout among physicians in the USA found that more than 54% reported at least one symptom of burnout, measured using the Maslach Burnout Inventory (MBI) [8]. Among all domains, the field of critical care scored highest in the prevalence of burnout (55%) [9]. However, during the same period, a nationwide study on burnout among Dutch intensivists found a very low burnout rate with a prevalence of only 4.4% [10]. In a recent systematic literature review on emotional distress among intensive care professionals, we suggested that the true magnitude of work-related stress remains unclear due to a lack of unity in concepts, related measuring instruments, and cut-off points [11]. In this chapter, we provide a historical impression and trends in work-related stress responses among intensive care professionals.

The Origin of Stress

Stress describes a person’s response to a threat or some other change in the environment, which goes beyond one’s resources for coping with the obstacle (events, people, and situations). Similarly, in a psychological definition, stress is, “the condition in which person – environment transactions lead to a perceived discrepancy between the physical or psychological demands of a situation and the resources of the individual’s biological, psychological, or social systems” [12].

Stress increases immediately if a defiant change or threat occurs. A certain amount of stress is necessary and important to perform activities and work tasks [13], also called eustress. The pathogenic role of stress was identified by physiologist Walter B. Cannon (1871–1945) in the ‘fight-or-flight’ response, as this mobilizes an individual to combat the threat or to flee in face of the stressful event [14]. This process could have negative consequences if the burden exceeds the individual’s capacity or when it becomes a chronic stress. A little later, this theory was expanded to the General Adaption Syndrome by Hans Selye (1907–1982), a medical doctor at Johns Hopkins University. He showed that environmental stressors activate the HPA axis (hypothalamus, pituitary gland, and adrenal cortex) and consequently increase cortisol levels associated with an immediate increase
in blood pressure and heart rate. In a chronic phase, these cortisol levels can lead
to cell damage and depletion of the body’s energy reserves [15]. Finally, the psy-
chologist Richard Lazarus (1922–2002) found that cognitive appraisal processes
can influence both the stress and the emotional experience [16]. The appraisal of
a situation causes an emotional, or affective, response that is going to be based on
that appraisal. An important aspect of this appraisal theory is that it accounts for
individual variances in emotional reactions to the same event. Therefore, work-
related stress might have different effects in individual healthcare professionals
even in situations of equal stress.

Both physical warning signs (headaches, sleeping disturbances, low back pain
and stomach problems) and mental responses (irritability or hostility, loss of con-
centration, low self-confidence and emotional instability) can indicate individual
stress reactions [12]. However, these are non-specific symptoms that do not depict
the origin of stress and subsequently constrain effective coping mechanisms and the
development of preventive strategies.

Exhaustion and Burnout

The Roman physician Galen (129–c216) wrote one of the earliest discussions on ex-
haustion, which he believed was an imbalance of the four humors – blood, yellow
bile, black bile and phlegm. An increase in black bile “slowed the body’s circulation
and clogged up the brain’s pathways, bringing about lethargy, torpor, weariness,
sluggishness and melancholy” [17]. Although this idea found no scientific basis,
even today many people with exhaustion, and subsequent foggy thinking, experi-
ence their brains filled with a tar-like liquid causing an extreme mental tiredness.
Many people throughout history have felt overtired, suggesting that fatigue and ex-
haustion could be part of the human condition.

Burnout was first described by Herbert J. Freudenberger (1926–1999). He bor-
rowed the term from the drug scene where it originally referred to the catastrophi-
cal influence of chronic drug abuse, and applied this concept to volunteers at the St
Mark’s Free Clinic in New York’s East Village who felt a gradual emotional deple-
tion, loss of motivation, and reduced commitment [18]. At the same time, burnout
was used by Maslach in a description of social workers who felt emotionally ex-
husted and developed negative perceptions about their clients. Since 1970, a con-
siderable body of knowledge about the nature of burnout, its causes and conse-
quences, and its prevalence in specific domains has emerged [19].

Burnout is currently seen as the most prevalent career crisis of the twenty-first
century. It is now characterized by a combination of three factors: emotional ex-
haustration, depersonalization and diminished personal accomplishment [18, 19]. An
official Critical Care Societies Collaborative statement provides an extensive sum-
mary of the symptoms, the causative factors and consequences of burnout in the
intensive care unit (ICU) [20]. Some of the risk factors for burnout include indi-
vidual characteristics, such as perfectionism, a compromised work-life balance and
a neurotic personality. However, organizational aspects, such as an increased work-
load and too many work hours, are related to high rates of burnout as well. Although some contradictions exist, younger professionals are at higher risk of burnout compared to older and more experienced professionals [11]. Some studies have reported that female ICU professionals are at higher risk [4, 21], whereas others found no difference between men and women [22, 23].

The Maslach Burnout Inventory (MBI) is seen as the standard tool for measuring the severity of burnout [21, 24, 25]. The MBI is a highly reliable and validated 22-item self-report questionnaire that evaluates the three domains of burnout in independent subscales [26]. However, since its development, the operationalization and measurement of burnout have differed across studies [11, 20]. Measuring only exhaustion, as an equivalent to burnout, is not sufficient and induces erroneously high prevalence rates. The high burnout rates as currently reported in public discussions are also confounded by the limited methodologic quality of the majority of the studies [27]. Cross-sectional studies may suffer from reverse causation, thus mixing cause and effect of work-related stress to burnout and emotional exhaustion. In addition, the low response rates, seen in some studies to be as low as 19% [8], could result in selection bias. Therefore, this cost of caring is overestimated. The concept of burnout might be misused to indicate an overall exhaustion with life; fatigue and tiredness may be a part of the human condition. It is highly recommended that burnout is investigated using longitudinal international studies in a valid and comparative manner, with clear cut-off points in all three domains, to indicate the significance of the problem among intensive care professionals.

Post-traumatic Stress During War

Crocq and Crocq provide an all-encompassing historical overview on the diseases that are currently labeled as post-traumatic stress disorder (PTSD) [28]. The authors stated that the first reported phenomenon of psychological consequences after witnessing terrifying situations emerged during early battles: “The first case of chronic mental symptoms caused by sudden fright in the battlefield is reported in the account of the battle of Marathon by Herodotus, written in 440 BC”. Hippocrates (c460–377 BC) also mentioned frightening battle dreams, and centuries later, Shakespeare wrote a line of poetry in his ‘Romeo and Juliet’ on the awakening of soldiers by re-experiencing past battles in their dreams. In 1678, a Swiss physician used “nostalgia”, which was followed by the “traumatic neurosis” of the German physician, Oppenheim, in 1884, to label similar psychological signs. In 1871, the physician Jacob Mendes Da Costa (1833–1900) described psychological war symptoms as the so-called “irritable heart”. He studied over 300 servicemen during the American Civil War (1861–1865) with complaints of chest pain, fatigue, dyspnea, palpitations, headaches and dizziness. He assumed a somatic cause from excessive marching [29]. However, later on, the irritable heart was also observed in civilians, especially young women who performed strenuous work and who were highly emotional. The term ‘neurasthenia’ or ‘nervous exhaustion’ was introduced in 1880 by the neurologist George Beard (1839–1883) [30] who assumed for the
first time that there was a certain predisposition in soldiers, which could be recognized before they were sent to battle.

After the First World War (1914–1918), the cardiologist Thomas Lewis (1881–1945) described 'the soldier’s heart' and the 'effort syndrome' [31]. Complaints were again shortness of breath, dizziness, headache, sighing, palpitations, chest pain, fatigue, confusion, forgetfulness and lack of concentration. The condition was explained as being somatically caused, such as from lack of sleep in the trenches and the effects of poisonous gas. Another term used during this war was, ‘shell shock’ (also named ‘trench neurosis’, ‘gas neurosis’ and ‘buried-alive neurosis’), which differed from the above mentioned syndromes by also giving rise to symptoms such as irritation, speech disorders, forgetfulness and other cognitive complains. Soldiers with a history of a ‘weak’ personality, family psychiatric disorders and a fragile physical constitution were predisposed to develop this condition. In the Second World War (1939–1945), once again soldiers suffered from the previously described symptoms. The terms ‘combat neurosis’, ‘battle fatigue’, ‘operational fatigue’ and ‘combat exhaustion’ were introduced to name this complex of symptoms. Obviously, these conditions were more a psychological or a psychiatric condition than related to somatic stresses. The symptoms were supposed to disappear after the war, but the phrase “You can take the man out the war, but you can never take the war out of the man” proved to be more truthful than expected. Even the term ‘the old sergeant syndrome’ was introduced when it became evident that veterans might suffer chronically from their war experiences. During the Vietnam War (1955–1975), the incidence was much lower than in the previous wars, but still soldiers suffered from ‘combat stress’ and ‘battle stress reactions’.

**Post-traumatic Stress in Healthcare**

In 1952, the first edition of the Diagnostic and Statistical Manual of Mental Disorders (DSM-1) was developed by the American Psychiatric Association (APA). This manual included ‘gross stress reaction’ to mention a stress syndrome that is a response to an exceptional physical or mental stress, such as a natural catastrophe or battle. In DSM-II (1968), this category disappeared, perhaps because of the peaceful era in which the manual was revised, only to be re-entered in DSM-III (1980), after the Vietnam War, as ‘post-traumatic stress disorder’. The PTSD diagnostic criteria were again revised in DSM-5, and are presented in Table 2, including the persistent effortful avoidance of distressing trauma-related stimuli among others (category 309.81 F43.10) [32]. A structured interview, such as the Clinician-Administered PTSD Scale for DSM-5 or the PTSD Symptom Scale-Interview, establishes the PTSD diagnosis. Disadvantages of these interviews are the prolonged administration time and the special training to guarantee the validity of the diagnosis. Although a number of self-report measurement instruments, such as the Davidson Trauma Scale or the Impact of Event Scale-Revised, assess the symptoms of PTSD, these measures do not accomplish a diagnosis of PTSD because of too many biased responses [33]. The estimated lifetime prevalence of PTSD in the National Comor-
bidity Survey Replication among adult Americans was 6.8% with a twelve-month
prevalence of 3.5% [34].

Some researchers have suggested that intensive care professionals experience
a traumatic work environment; these studies have found that 21–29% of respon-
dents tested positive for symptoms of PTSD [35, 36]. Most of the traumatic events

<table>
<thead>
<tr>
<th>Table 2</th>
<th>Criteria of post-traumatic stress disorder, adopted from DSM-5 manual</th>
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</thead>
<tbody>
<tr>
<td><strong>Criterion A: stressor</strong></td>
<td>The person was exposed to: death, threatened death, actual or threatened serious injury, or actual or threatened sexual violence, as follows: (one required)</td>
</tr>
<tr>
<td>1</td>
<td>Direct exposure</td>
</tr>
<tr>
<td>2</td>
<td>Witnessing, in person</td>
</tr>
<tr>
<td>3</td>
<td>Indirectly, by learning that a close relative or close friend was exposed to trauma. If the event involved actual or threatened death, it must have been violent or accidental</td>
</tr>
<tr>
<td>4</td>
<td>Repeated or extreme indirect exposure to aversive details of the event(s), usually in the course of professional duties (e.g., first responders, collecting body parts; professionals repeatedly exposed to details of child abuse). This does not include indirect non-professional exposure through electronic media, television, movies or pictures</td>
</tr>
<tr>
<td><strong>Criterion B: intrusion symptoms</strong></td>
<td>The traumatic event is persistently re-experienced in the following way(s): (one required)</td>
</tr>
<tr>
<td>1</td>
<td>Recurrent, involuntary, and intrusive memories. Note: Children older than six may express this symptom in repetitive play</td>
</tr>
<tr>
<td>2</td>
<td>Traumatic nightmares. Note: Children may have frightening dreams without content related to the trauma(s)</td>
</tr>
<tr>
<td>3</td>
<td>Dissociative reactions (e.g., flashbacks) which may occur on a continuum from brief episodes to complete loss of consciousness. Note: Children may re-enact the event in play</td>
</tr>
<tr>
<td>4</td>
<td>Intense or prolonged distress after exposure to traumatic reminders</td>
</tr>
<tr>
<td>5</td>
<td>Marked physiologic reactivity after exposure to trauma-related stimuli</td>
</tr>
<tr>
<td><strong>Criterion C: avoidance</strong></td>
<td>Persistent effortful avoidance of distressing trauma-related stimuli after the event: (one required)</td>
</tr>
<tr>
<td>1</td>
<td>Trauma-related thoughts or feelings</td>
</tr>
<tr>
<td>2</td>
<td>Trauma-related external reminders (e.g., people, places, conversations, activities, objects or situations)</td>
</tr>
<tr>
<td><strong>Criterion D: negative alterations in cognition and mood</strong></td>
<td>Negative alterations in cognition and mood that began or worsened after the traumatic event: (two required)</td>
</tr>
<tr>
<td>1</td>
<td>Inability to recall key features of the traumatic event (usually dissociative amnesia; not due to head injury, alcohol, or drugs)</td>
</tr>
<tr>
<td>2</td>
<td>Persistent (and often distorted) negative beliefs and expectations about oneself or the world (e.g., “I am bad,” “The world is completely dangerous”)</td>
</tr>
<tr>
<td>3</td>
<td>Persistent distorted blame of self or others for causing the traumatic event or for resulting consequences</td>
</tr>
<tr>
<td>4</td>
<td>Persistent negative trauma-related emotions (e.g., fear, horror, anger, guilt or shame)</td>
</tr>
<tr>
<td>5</td>
<td>Markedly diminished interest in (pre-traumatic) significant activities</td>
</tr>
<tr>
<td>6</td>
<td>Feeling alienated from others (e.g., detachment or estrangement)</td>
</tr>
<tr>
<td>7</td>
<td>Constricted affect: persistent inability to experience positive emotions</td>
</tr>
</tbody>
</table>
Table 2 (Continued)

<table>
<thead>
<tr>
<th>Criterion E: alterations in arousal and reactivity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Trauma-related alterations in arousal and reactivity that began or worsened after the traumatic event: (two required)</td>
</tr>
<tr>
<td>1 Irritable or aggressive behavior</td>
</tr>
<tr>
<td>2 Self-destructive or reckless behavior</td>
</tr>
<tr>
<td>3 Hypervigilance</td>
</tr>
<tr>
<td>4 Exaggerated startle response</td>
</tr>
<tr>
<td>5 Problems in concentration</td>
</tr>
<tr>
<td>6 Sleep disturbance</td>
</tr>
</tbody>
</table>

**Criterion F: duration**

Persistence of symptoms (in Criteria B, C, D, and E) for more than one month

**Criterion G: functional significance**

Significant symptom-related distress or functional impairment (e.g., social, occupational)

**Criterion H: exclusion**

Disturbance is not due to medication, substance use, or other illness

Specify if: with dissociative symptoms

In addition to meeting criteria for diagnosis, an individual experiences high levels of either of the following in reaction to trauma-related stimuli:

1 Depersonalization: experience of being an outside observer of or detached from oneself (e.g., feeling as if “this is not happening to me” or one were in a dream)

2 Derealization: experience of unreality, distance, or distortion (e.g., “things are not real”)

Specify if: with delayed expression.

Full diagnosis is not met until at least six months after the trauma(s), although onset of symptoms may occur immediately

Presented in these studies on PTSD, such as verbal abuse, massive bleeding in the patient, or stress related to feeling overextended due to an inadequate professional to patient ratio, do not meet the DSM-5 criteria for PTSD. Although these situations may be stressful and may result in negative personal effects, this should not lead to the medicalization of normal human emotional responses or turn to over-diagnosis with potential overtreatment [37]. Witnessing a person’s death, which is stated as a potential risk for PTSD, and providing palliative care might raise feelings of grief and pain in intensive care professionals, in particular if the patient is of a younger age or in a comparable situation to the professional’s own surroundings. These feelings should be considered as normal human reactions and part of the normal process of dealing with one’s emotions. The majority of individuals recover spontaneously after a traumatic situation [38]. Many people are exposed to loss or potentially traumatic events throughout their life span. However, most of them successfully endure the temporary emotional disturbance, with no apparent interference in functioning at work or in close relationships [39]. This process typically occurs because many individuals show resilience, which is the capacity to stay mentally healthy and to positively adapt after experiencing profound events. Intensive care professionals may have adapted their individual coping strategies to the demanding work environment to find emotional balance.
Thus, apart from some exceptional cases, such as being involved in a medical error, a natural disaster, or a war situation, it is very unlikely that intensive care professionals are traumatized by their emotionally demanding work. PTSD, and its related symptoms stemming from war veterans, is completely different from work-related stress in ICU professionals.

The Foundation of Compassion Fatigue

In the early 1980s, the term ‘compassion fatigue’ was used in American policy documents in reference to immigration and in the early 1990s to describe the lack of interest in homeless people by the general public. In 1992, Carol Joinson, a nurse educator in Texas, described compassion fatigue as the loss of compassion due to repeated exposure to suffering during work [40]. Slightly later, the psychologist Charles Figley defined this phenomenon as secondary traumatic stress resulting from a deep involvement with a primarily traumatized person because of the “more friendly framing” [41]. Figley proposed in 1995 that compassion fatigue is an excessive empathic reaction after witnessing another’s suffering, resulting in symptoms such as anxiety, irritability, intrusive thoughts, hypervigilance or startle reactions, and avoidance of patient care. Although conceptually different, since then compassion fatigue and secondary traumatic stress have been used interchangeably, with suggested similarities between vicarious traumatization and burnout [11]. While compassion fatigue has been studied predominantly in the nursing field [42, 43], high risks were also found in physicians, ranging from 9 to 20% [44, 45].

Some scientists posed critical notes on the empirical understanding of compassion as a fundamental element of compassion fatigue, which is not equivalent to empathy, as used by Figley [46, 47]. His model identifies empathic ability as the capacity of health care providers to notice pain in others, and as a response, to project themselves into this emotional energy, thus feeling the pain, grief, desperation, or anger. However, a fundamental and profound theory on the concept of compassion is lacking. Thus, being empathic all of the time is perhaps too much of a good thing, with distancing or dehumanization as the result. Additionally, The Professional Quality of Life Scale, the newest modified measuring instrument on compassion fatigue, evaluates items responding to secondary stress [48]. This seems to be insufficient to meet the concept of compassion in the first place. In the last two decades, compassion fatigue has become a fashionable hype that should be critically reexamined or erased in favor of a new debate on work-related stress among intensive care professionals.

The Positive Approach of Work Engagement

In 1990, Robert Louis Kahn, an American psychologist, first described “personal engagement”. He stressed the psychological conditions of personal engagement and disengagement at work. In optimal engagement, the individual’s values co-
incide with the role of performance in all aspects (physical, cognitive, and emotional) while working [49]. In a further development, work engagement has been defined as a positive, fulfilling, work-related state of mind, which is characterized by vigor, dedication, and absorption [26]. Wilmar Schaufeli et al. stated that, “Vigor is characterized by high levels of energy and mental resilience while working, the willingness to invest effort in one’s work, and persistence even in the face of difficulties; dedication by being strongly involved in one’s work, and experiencing a sense of significance, enthusiasm, inspiration, pride, and challenge; and absorption by being fully concentrated and happily engrossed in one’s work, whereby time passes quickly and one has difficulties with detaching oneself from work” [26]. Engaged employees believe in themselves, generate their own positive feedback, set higher goals, have values that match with the organization, and show a sustained healthy state. As illustrated in Fig. 1, work engagement with its positive labeled elements is the counterbalance to work-related stress. In general, work engagement is influenced by job autonomy, social support, performance feedback, and personal resources such as self-efficacy, flexibility and adaptability. Work engagement is firmly grounded in the Job-Demands-Resources Model [26].

From Historical Facts to Future Direction

Health care organizations should think of improvements and provide support in daily practice, in addition to individual activities to promote well-being, such as self-care in nutrition, sleep, exercise, and spending time with family or friends [4, 8]. The urge of a call for action has been heard and endorsed by all healthcare providers now. Evidence-based interventions are needed to address the most effective contributing factors; however, persuasive randomized controlled trials in this
domain have not yet been performed [20]. Probably, there is not one simple solution that will fit all. Stimulating a healthy work environment is a multidimensional challenge, a traffic map with multiple roads leading to the same point of interest. Some promising suggestions are to regulate the environment and workload, have adequate administrative support systems, and find meaning in work [4].

Education and early recognition of the stress-related consequences among intensive care professionals could provide some answers as well. Furthermore, personal development of resilience may provide the basic adaptability to flourish in the hectic and ever demanding ICU environment. ICU professionals have learned to respond to these emotionally difficult situations. Indeed, we must take care of ourselves [50]; however, we should not forget that working in the ICU can be exciting and pleasurable too.

References

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