Medycyna Pracy. Workers' Health and Safety 2023;74(5):353–362
http://medpr.imp.lodz.pl/en
https://doi.org/10.13075/mp.5893.01401
ORIGINAL PAPER

RELAXATION AND STRAIN AMONG EMERGENCY MEDICAL SERVICE PERSONNEL AND EMERGENCY CONTROL CENTER DISPATCHERS DURING THE FIRST TWO WAVES OF THE SARS-CoV-2 PANDEMIC

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Abstract

Background: Workloads of emergency medical service personnel (EMP) and emergency control center dispatchers (CCDs) were manifold. The SARS-CoV-2 pandemic presented new challenges for the prehospital emergency medical service. The purpose of this study was to compare the status of stress/strain and recovery of *Recovery-Stress Questionnaire* among EMP and CCDs in Germany during the first 2 waves of the SARS-CoV-2 pandemic both between occupational groups and over time. **Material and Methods:** A total of 2426 emergency medical service personnel and control center dispatchers were questioned with the *Recovery-Stress Questionnaire* based on Kallus. The results from the first 2 waves of the pandemic (June–August 2020 and January–February 2021) were compared. **Results:** During the first and second wave of SARS-CoV-2 pandemic, the subjectively perceived stress of emergency medical service personnel and control center dispatchers increased, but recovery decreased. The CCDs showed more unfavorable values compared to EMP. **Conclusions:** Health promotion interventions are necessary to counteract possible career changes or mental or other diseases due to insufficient management. Med Pr Work Health Saf. 2023;74(5):353–62.

Key words: recovery, stress, strain, emergency medical services, pandemic time, ambulance service

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Received: June 4, 2023, accepted: September 27, 2023

INTRODUCTION

Recovery-related processes have particularly high importance in compensating for occupational stress-factors [1]. Basic to this study was the recovery-stress model that considers current stress events and psychological processes [2]. Recovery is a resource that contributes to a decrease in work stress (strain) and regeneration after stressful situation. Good recovery prevents consequences of strain and diseases [3]. Stress and recovery interact with each other [3]. Stressors can cause diseases, especially when the possibilities of compensatory mechanisms are exhausted and when recovery processes do not sufficiently occur [4–6]. Stressful situations in the first and second waves of the SARS-CoV-2 pandemic can be explained by the momentary state of the last three days of recovery stress experienced by emergency medical personnel (EMP) and emergency control center dispatchers (CCDs). These individuals are under extraordinary stress during the SARS-CoV-2 pandemic [7,8]. Working under stressful conditions, which employees tolerate for long periods of time and, in particular, compensate poorly, can have negative effects on physical and mental health [9]. The basic theoretical model for the development of health impairments as a result of occupational stress situations in this study is the stress-strain concept, whereby a lack of organizational, psychosocial, and personal resources to cope with the stress lead to a state of psychological stress [10]. This state of stress is considered to be an interaction between the individual and his or her environment and may continue for some time after the stressful situation has ended [11].

The 7-day incidence of corona infection (COVID-19) in Germany from June to August 2020 was 3–5 cases per 100 000 population. It increased to 91–197 cases per 100 000 population by January–February 2021 [12]. Exact data for the rescue service could not be determined. Ambulance services count as facilities under §23 of the Infection Protection Act, as do hospitals.

As of June 20, 2020 13 669 individuals from these facilities had been affected, 632 of whom were hospitalized and 20 of whom had died [12]. As of January 2, 2021 19 973 persons from these facilities had become ill, of whom 13 042 were hospitalized and 3156 had died [13]. In a major German city with a population of >770 000, the incidence of covid infection among medical personnel was 11.8% (319 from 2700 subjects) of all reported COVID-19 cases from March to August 2020 [14].

The physical and mental health of rescue workers is a basic requirement for the successful performance of challenging activities in prehospital emergency medical services and in control centers.

Workloads and resources of EMP and CCDs

The EMP are exposed to a wide range of physical, psychological, social and organizational stressors during their professional activities [15–17]. The CCDs have the same challenges as EMPs with some additional ones. The CCDs perform telephone triage of the emergency call. They assess the emergency call subjectively through auditory perception without visual identification. Telephone resuscitations are unquestionably subject to professional and social responsibility [18]. Of course, this also applies to emergency medical service (EMS). Other notable stressors for CCDs and EMP include traumatic and emotional events, lack of control over high workloads, lack of management support, and time pressures at work [18].

In addition, there are requirements regarding general personality traits of EMP and CCDs, such as the "need to be in control" and being "compulsive," "highly motivated by internal factors," "action-oriented," and "risk takers" [16]. However, personal resources in the work process, such as coherence experience, self-efficacy, stress management skills, internal control beliefs, future orientation, optimism, professional competence, and social resources (e.g., networks, positive working atmosphere, positive feedback, and support by managers, colleagues, etc.) can also promote positive aspects of mental health [19]. Work-related resources, such as a variety of tasks, scope for activities, decision-making and action, use of qualifications, development and career opportunities, and participation, can help to counteract the negative effects of work stress on mental stress [20].

General challenges during the SARS-CoV-2 pandemic for the health care system, especially EMS

Over the past 3 years, the SARS-CoV-2 pandemic has dominated daily life in many places and continues to pose unique challenges to the entire health care system [21]. The World Health Organization (WHO) classified COVID-19 as a "public health emergency of international concern" [22], which affects all aspects of life. The COVID-19 presented a major challenge to public health. The consequences of the viral pandemic were almost unknown, and there was no vaccine and a lack of safety equipment at the beginning of the pandemic [23]. During the second wave, there was an attempt to balance successful health care and a growing economy. Despite this balancing act, there was a dramatic increase in infections, which in turn led to severe restrictions on outdoor activities, the obligation to wear face masks, and the prevention of human gatherings [23,24].

Globally, the use of emergency medical services has increased [25,26]. In addition, the current SARS-CoV-2 pandemic led to an increase in the use of prehospital EMS, although this also decreased in some regions during times of lockdown [27,28]. For 88% of CCDs and 91% of EMP in Germany, workloads increased during the pandemic, and 56% of CCDs and 58% of EMP were dissatisfied with their work [7,29]. In addition to the physical strain of wearing substantial personal safety equipment, a lack of research knowledge about the contagiousness and modes of transmission of a new, as yet unknown infection and about the course of COVID-19 led to great uncertainties and an above-average mental strain during the first waves of the pandemic [30,31]. In addition, it should be noted that the preconditions for recovery processes in everyday life situations were impaired, e.g., through the care of children, home schooling, sharing home offices with life partners, and social isolation [31].

The aim of this study was to compare the differences in stressful situations during the first 2 SARS-CoV-2 pandemic waves and their effects on recovery and stress among emergency medical service personnel and control center dispatchers in Germany. Given the new challenges during the SARS-CoV-2 pandemic, the authors hypothesized that stress increased, recovery decreased, and these effects differed in both occupational groups.

MATERIAL AND METHODS

A voluntary and anonymous cross-sectional online survey among German EMP and CCDs at 2 different time points: June–August 2020 (t1) and January–February 2021 (t2) was conducted. The survey was conducted directly at the end of the first and during the second wave in Germany. The tool used for the online study was SurveyMonkey.

Both professional groups were recruited via the journal "Rettungsdienst" (S+K Publisher, Edewecht, Germany) and various social media, such as the website of the journal "Rettungsdienst," Facebook and Instagram. It was not possible to determine the response rate due to the nature of the recruitment for the online survey.

All investigations on humans were carried out in accordance with the appropriate ethics committee of the Medical Faculty of Otto von Guericke University Magdeburg (No. 61/13, updated 2018) in accordance with national legislation as well as according to the declaration of Helsinki. All informed participants submitted a declaration of consent.

Subjects

This study used 2426 complete records from full-time EMP and CCDs working full or part time. For t1, 805 records from EMP (651 males, 154 females) and 440 from CCDs (406 males, 34 females) were evaluated. For t2, 1131 records from EMP (951 males, 180 females) and 50 records from CCDs (47 males, 3 females) were used. The percentage of female EMP in Germany has increased since 2000 from 11 000 (25%) to now 25 000 (32%) in 2020 [32]. This means that women are somewhat underrepresented.

The age of EMP at t1 was M±SD 36.01±10.48 years, and at t2 M±SD 34.16±10.45 years. The age of CCD was higher at t1 – M±SD 42.43±8.75 years, and at t2 M±SD 40.82±9.21 years. The significances were EMP t1– EMP t2 $p < 0.001$, EMP t1 – CCD t1 $p < 0.001$, EMP t1 – EMP t2 $p < 0.01$, EMP t2 – CCD t1 $p < 0.001$, and EMP t2 – CCD t2 $p < 0.001$.

Methods

The *Recovery-Stress Questionnaire* (*Erholungs-Belastungs-Fragebogen* – EBF) based on Kallus [33] was used to identify the stress of the participants. The short form of the EBF-24/A comprises 24 items that can be used to assess the frequency and impact of stress and recovery activities on personal wellbeing. The rating on a 7-point scale of 0 ("never") to 6 ("all the time") refers to the period of the last 3 days and nights. For example, questions from EBF were: "the last (3) days and nights… I was unconcentrated, … I was dissatisfied, or … I felt physically relaxed."

Twelve subscales were formed (mean values), which were assigned to the scales "stress" and "recovery." The specified acceptable range of the stress state is between 0 – never and 2 – sometimes and that of the recovery state is between 4 – often and 6 – always [33].

The higher the values were, the more prominent the stress or recovery. The Cronbach's α of the dimension "stress" was $\alpha = 0.917$ (excellent), and that of the dimension "recovery" was $\alpha = 0.851$ (good). Thus, the reliability was confirmed.

Statistical analyses

The online data were transferred to the psychodiagnostic Vienna system (Schuhfried, Mödling, Austria) and then analyzed by computer. The software SPSS 26 for Windows was used for statistical analysis. First, frequency analyses were carried out for the total sample with additional collection of descriptive characteristic values such as mean and standard deviation as well as median with associated minimum and maximum. Testing for data with a normal distribution was performed using the Kolmogorov-Smirnov test. Sex and age distribution were tested with the χ^2 test. The Kruskal-Wallis test and *post hoc* Bonferroni test for nonnormally distributed interval-scaled variables and ordinal variables were used since due to the anonymity of the online survey, it could not be concluded that all respondents in the second wave also participated in the survey for the first pandemic wave. Further analyses of the data were carried out using a general linear model (GLM). A multifactorial analysis of variance/ANOVA was used to analyze the associations of the variables sex, age and pandemic wave on the "recovery" and "stress" dimensions.

According to Cohen [34], the limits for the size of the effect (η^2) were 0.01 (small effect), 0.06 (medium effect), and 0.14 (large effect).

RESULTS

Sociodemographic data of the subjects

The sex and age distributions differed significantly ($p < 0.001$). Females were in the clear minority. The CCDs at t1 and t2 were significantly older than EMP at t1 and t2. The results are presented in Table 1.

Expressions of the variables of strain and recovery between first and second waves

There was a significant increase in stress and a significant decrease in recovery in both occupational groups compared first to second wave (Table 2). Mean values of stress were significantly higher among CCD compared to EMP and in the second pandemic wave compared to the first wave. The CCDs reported significantly lower recovery and higher strain than EMP. Both strain and

Table 1. Gender distribution of emergency medical personnel (EMP) and control center dispatchers (CCD) according to sample (June–August 2020 and January–February 2021, Germany)

Sample	Participants (N = 2426) [n (%)]		
	male (N = 2055, 84.7%)	female (N = 371, 15.3%)	total
EMP t1 (N = 805)	651 (80.9)	154 (19.1)	805 (100.0)
CCD t1 (N = 440)	406 (92.3)	34 (7.7)	440 (100.0)
EMP t2 (N = 1131)	951 (84.1)	180 (15.9)	1131 (100.0)
CCD t2 (N = 50)	47 (94.0)	3 (6.0)	50 (100.0)

CCD – emergency control center dispatchers, EMP – emergency medical personnel, t1 – first wave of SARS-CoV-2 pandemic (June–August, 2020), t2 – second wave of SARS-CoV-2 pandemic (January–February, 2021).
p-value in χ^2 test statistically significant (<0.001).

recovery variables were above or below the acceptable range. The greatest expression was found for the strain subscale "overtiredness-time pressure" in both time periods ($p < 0.001$). Occupational group differences were also found for this subscale ($p < 0.001$). For EMP, the recovery subscale "general recovery-wellbeing" was the most significant, and for CCDs, the recovery subscale "success-capability" was most prominent. There was a significant decrease during the two waves for EMP ($p < 0.001$) but not for CCDs.

Multifactorial analyses of variance

The results of the multifactorial analyses of variance are shown in Table 3. All EBF variables were highly significant in the corrected model. A medium effect was found for the recovery subscale "recovery in the social field" ($p < 0.001$, $\eta^2 = 0.12$). An individual analysis of the subscale "recovery in the social field" of the confounders sex, age and (occupational) group showed a small effect only for age. The confounders offered hardly any relevant effects on the EBF variables when considered individually.

DISCUSSION

This study focused on subjective perceptions of stress and recovery among primary EMS employees, including emergency control center dispatchers, during the first 2 waves of the SARS-CoV-2 pandemic. The pandemic is also associated with an increase in stress for EMP and CCDs [28,31]. In this study, subjectively perceived stress increased but recovery decreased in both groups. This applied to both occupational groups, with CCDs showing worse values here than EMP in each case. The strongest complaint was "overtiredness-time pressure" during both waves and for both occupational groups. Recovery variables were below the recommended normal range early in the pandemic and worsened during the second wave.

The CCDs showing unfavorable values were probably due to predominantly mental stress, as their work is mainly performed remotely on the phone. The authors assume that EMP can better assess an emergency on site and actively do something physical against the emergency. The main variables "strain" and "general stress-despondency" increased significantly in both groups during the 2 waves but more among CCDs than among EMP. Perhaps both a general increase in workload (e.g., more alerts) [25,26,28,35] and an influence of social media and media press on mental health status can be found here [36]. For example, CCDs faced additional work, initially sending only 1 transport ambulance to the emergency scene and, if necessary, only sending an emergency physician when requested [37]. The increase in "emotional stress" or "unresolved conflicts-lack of success" can be explained, for example, by a role conflict because the best possible care for a patient cannot be guaranteed with feelings of guilt or shame [31,38]. The variable "social tensions" was also increased. Fear of the disease may be a cause for this. In the first 2 waves, SARS-CoV-2, the disease, and the consequences were still unknown. The first vaccinations against COVID-19 were then available from December 2020. Inter- and intrapersonal tensions could occur between vaccinated and unvaccinated personnel or patients, infected and ill colleagues or patients discussing vaccination versus complications of vaccination, and in initial refusal to vaccinate even though emergency medical service personnel were prioritized [31,39]. Additional work due to illness of colleagues, higher frequency of alerts, increased hygiene requirements or planning of secondary transports in particularly hard-hit regions are

Table 2. *Recovery-Stress Questionnaire* (*Erholungs-Belastungs-Fragebogen* – EBF) characteristics of all samples (June–August 2020 and January–February 2021, Germany)

Variable	EMP t1		CCD t1		EMP t2		CCD t2		p	
	M±SD	Me (min.–max)	M±SD	Me (min.–max)	M±SD	Me (min.–max)	M±SD	Me (min.–max)	Kruskal-Wallis test	*post-hoc* test
Strain	2.5±1.0	2.43 (0.29–5.43)	2.5±1.1	2.36 (0.36–5.86)	2.9±1.0	2.86 (0.29–5.86)	3.1±0.9	3.14 (1.14–4.93)	**<0.001**	**C1–E2 <0.001 C1–C2 <0.001 E1–E2 <0.001 E1–C2 <0.001**
General stress – despondency	2.45±1.38	2.50 (0–6)	2.33±1.48	2.00 (0–6)	2.92±1.40	3.00 (0–6)	3.19±1.23	3.50 (0.5–5.5)	**<0.001**	**C1–E2 <0.001 C1–C2 <0.001 E1–E2 <0.001 E1–C2 <0.001**
Emotional stress	2.6±1.1	2.50 (0–6)	2.6±1.2	2.50 (0.5–6)	3.2±1.2	3.00 (0–6)	3.4±1.0	3.50 (1–5.5)	**<0.001**	**C1–E2 <0.001 C1–C2 <0.001 E1–E2 <0.001 E1–C2 <0.001**
Social tensions	2.7±1.2	2.50 (0–6)	2.7±1.3	2.50 (0–6)	3.2±1.2	3.00 (0–6)	3.5±1.2	3.50 (1–5.5)	**<0.001**	**C1–E2 <0.001 C1–C2 <0.001 E1–E2 <0.001 E1–C2 <0.001**
Unresolved conflicts – lack of success	2.6±1.3	2.50 (0–6)	2.6±1.3	2.50 (0–6)	2.7±1.3	3.00 (0–6)	3.0±1.3	3.00 (0.5–5.5)	**0.004**	**E1–E2 0.001 E1–C2 0.039**
Overtiredness – time pressure	2.9±1.3	3.00 (0–6)	2.8±1.4	2.50 (0–6)	3.2±1.4	3.50 (0–6)	3.6±1.2	4.00 (1–5)	**<0.001**	**C1–E2 <0.001 C1–C2 <0.001 E1–E2 <0.001 E1–C2 0.001**
Lack of energy – lack of concentration	2.2±1.1	2.00 (0–5.5)	2.1±1.3	2.00 (0–6)	2.6±1.3	2.50 (0–6)	2.6–1.3	2.50 (0.5–5.5)	**<0.001**	**C1–E2 <0.001 C1–C2 0.005 E1–E2 <0.001**
Physical ailments	2.1±1.3	2.00 (0–6)	2.2±1.3	2.00 (0–6)	2.4±1.3	2.50 (0–6)	2.7±1.2	2.50 (0.5–5)	**<0.001**	**C1–E2 <0.001 C1–C2 0.004 E1–E2 <0.001 E1–C2 0.002 E1–C1 0.007**
Recovery	2.98±0.90	2.90 (0.7–5.5)	3.03±0.94	3.00 (0.8–5.6)	2.64±0.89	2.60 (0.1–5.6)	2.50±0.81	2.30 (0.8–4.7)	**<0.001**	**C1–E2 <0.001 C1–C2 0.001 E1–E2 <0.001 E1–C2 0.001**
Success – capability	3.0±1.1	3.00 (0–5.5)	3.3±1.1	3.50 (0.5–6)	2.7±1.1	2.50 (0–6)	3.2±1.0	3.25 (0.5–5.5)	**<0.001**	**C1–E2 <0.001 E1–E2 <0.001 E2–C2 0.006 E1–C1 <0.001**
Recovery in the social field	2.9±1.2	3.00 (0.5–6)	2.8±1.1	2.50 (0–5.5)	2.2±1.0	2.00 (0–6)	2.1±0.9	2.00 (0.5–5)	**<0.001**	**C1–E2 <0.001 C1–C2 <0.001 E1–E2 <0.001 E1–C2 <0.001**
Physical recovery	2.9±1.1	3.00 (0–6)	2.9±1.2	3.00 (0.5–6)	2.6±1.1	2.50 (0–6)	2.3±1.0	2.00 (0.5–5)	**<0.001**	**C1–E2 <0.001 C1–C2 0.002 E1–E2 <0.001 E1–C2 0.001**
General recovery – wellbeing	3.3±1.1	3.50 (0.5–6)	3.3±1.2	3.50 (0.5–6)	2.924±1.2	3.00 (0–6)	2.6±1.0	2.50 (1–5)	**<0.001**	**C1–E2 <0.001 C1–C2 <0.001 E1–E2 <0.001 E1–C2 <0.001**
Restorative sleep	2.8±1.4	2.50 (0–6)	2.9±1.4	3.00 (0–6)	2.7±1.4	2.50 (0–6)	2.3±1.2	2.50 (0.5–5)	**0.014**	**C1–E2 0.024 C1–C2 0.007 E1–C2 0.020**

CCD – emergency control center dispatchers, EMP – emergency medical personnel, t1 – first wave of SARS-CoV-2 pandemic (June–August, 2020), t2 – second wave of SARS-CoV-2 pandemic (January–February, 2021).
Bolded are the significant p-values.

Table 3. *Recovery-Stress Questionnaire* (*Erholungs-Belastungs-Fragebogen* – EBF) characteristics considering demographic data and samples with assessment of effect size (η^2) (June–August 2020 and January–February 2021, Germany)

Variable	Corrected model			Gender		Age		Group	
	F	p	η^2	p	η^2	p	η^2	p	η^2
Strain	24.913	**<0.001**	0.049	**<0.001**	0.010	0.073	0.001	0.131	0.002
General stress – despondency	20.982	**<0.001**	0.042	**<0.001**	0.006	0.393	<0.001	0.193	0.001
Emotional stress	33.025	**<0.001**	0.064	**<0.001**	0.005	**0.034**	0.002	0.184	0.001
Social tensions	20.399	**<0.001**	0.040	**0.023**	0.002	**<0.001**	0.006	0.056	0.002
Unresolved conflicts – lack of success	5.112	**<0.001**	0.010	**0.002**	0.004	**0.022**	0.002	0.381	0.001
Overtiredness – time pressure	12.965	**<0.001**	0.026	**0.001**	0.005	**0.018**	0.002	0.054	0.002
Lack of energy – lack of concentration	14.624	**<0.001**	0.029	**0.004**	0.003	0.105	0.001	0.311	0.001
Physical ailments	25.774	**<0.001**	0.051	**<0.001**	0.030	0.067	0.001	**0.041**	0.003
Recovery	26.355	**<0.001**	0.052	**0.010**	0.003	**<0.001**	0.012	0.187	0.001
Success – capability	22.296	**<0.001**	0.044	**0.017**	0.002	**0.045**	0.002	**<0.001**	0.011
Recovery in the social field	67.816	**<0.001**	0.123	0.235	0.001	**<0.001**	0.044	0.863	<0.001
Physical recovery	9.062	**<0.001**	0.018	**0.009**	0.003	0.106	0.001	0.132	0.002
General recovery – wellbeing	23.057	**<0.001**	0.045	0.147	0.001	**<0.001**	0.015	0.411	0.001
Restorative sleep	3.325	**0.005**	0.007	**0.024**	0.002	0.204	0.001	0.096	0.002

Effect size (η^2): 0.01 (small effect), 0.06 (medium effect), and 0.14 (large effect).
Bolded are the significant p-values.

possible reasons for the increase in "overtiredness-time pressure," "lack of energy-lack of concentration" and "physical ailments" in both groups. "Physical ailments" include increased skin irritations during the pandemic, such as atopic dermatitis, acne and seborrheic dermatitis [40]. A systematic review and meta-analysis showed that skin diseases lead to negative effects on sleep, mental health, and quality of life [41].

In summary, all strain variables of the EBF increased for both groups during the 2 waves of SARS-CoV-2 pandemic. This suggests that the increasing workloads are causal for the presented decrease in recovery, including "success capability," "physical recovery," general recovery-wellbeing," and "restorative sleep." The obligation to be quarantined in the event of illness or infection during the survey period and contact restrictions can provide indications of decreased "recovery in the social field." Isolation and physical distancing have known mental health impacts [42]. "Restorative sleep" decreased in authors' results. Similar results were shown in a systematic review in which sleep disorders were more likely to affect health care workers, especially frontline workers [43]. Since the studies on the SARS-CoV-2 pandemic are still ongoing, there is currently little data on EMP, in some cases only hypotheses can be listed or transferred from other occupational groups. Further research studies are needed here.

No relevant influences of sex, age or group on the results were found. A systematic review of the psychological impact of the COVID-19 pandemic among frontline health care professionals showed no influence of age on stress, anxiety, depression, or sleep disturbance [44]. However, the same study showed higher levels of stress among women, which was not found in authors' country [44]. Although CCDs predominantly perform psychological work and EMP perform physical and psychological work, no significant influence of the variable "group" on the results was found.

Job overload increases tendency to drop out, which can be observed especially among health care personnel. More precise data on rescue service personnel are not known [45]. Many health care workers experienced the pandemic as a potentially traumatic stressful event or experienced high levels of escalating stress [46]. The results of this study also showed the importance (not only from an occupational health and health promotion perspective) of creating general conditions that support health promotion with the aim of preventing the risk of mental disorders such as anxiety disorders, depression, or burnout [47,48]. Various studies have proven the connection of mental or other diseases in the absence of stress compensation [4,49,50]. Health promotion interventions are necessary to counteract career changes in the face of persistently high stress and inadequate

compensation. For example, 23.8% of EMP would be very likely to leave their job in the next 6 months [51].

Organizational, social, personal, and psychological factors should be promoted [52]. Resources and personal competence development should also be promoted to reduce stress and strain [52].

Limitations

Preexisting mental health conditions were not identified, which could have an influence on the results [44]. Regional differences depending on the extent of the pandemic were not considered. Consequently, it cannot be ruled out that EMP or CCDs, who were especially stressed, participated in this study at all. Selection bias due to the online survey cannot be ruled out. It is possible that only people who were interested in the topic of the survey will participate. This is especially important when there are high workloads. No circumstances from the private sphere were considered, such as homeschooling, lack of childcare at the beginning of the pandemic, or caring for relatives, which could lead to an increased sense of stress. All EMP qualifications were summarized and used as 1 group. The qualification level could although have an influence on the results but was not identified separately here. A gender difference is apparent. It may be a "self-selection bias of the sample," but this occupational group is still very male-dominated, so this distribution may also correspond to the actual gender distribution in this occupational group. In the case of online surveys, it cannot be ruled out with certainty that only EMPs or CCDs participated in the study. However, the online study was also only shared in journals or social media of emergency medical services disciplines, so that the risk was reduced. The sample size is representative for the region of Saxony-Anhalt. Since similar working conditions exist throughout Germany, these can be transferred to other federal states.

CONCLUSIONS

In summary, the results highlight the need for action because stress in both EMP and CCDs is increasing but recovery is decreasing. The implementation of further studies with EMP and CCDs to create a meaningful body of evidence considering the ongoing pandemic situation is necessary. In comparison, interdisciplinary networking, and exchange of experience with other health care professions appear useful to classify the results and develop interventions for relationship and behavioral prevention to reduce stressor and strain, and to increase recovery.

ACKNOWLEDGEMENTS

The authors would like to thank Julia Botscharow, who was particularly involved in the data evaluation.

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References: Irina Böckelmann, Beatrice Thielmann

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Publisher: Nofer Institute of Occupational Medicine, Łódź, Poland