

# CURRENT INCIDENCE OF PROFESSIONAL BURNOUT AMONG UKRAINIAN ONCOLOGISTS IN KHARKIV

IRINA BÖCKELMANN<sup>1\*</sup>, IGOR ZAVGORODNIJ<sup>2\*</sup>, OLENA LITOVCHENKO<sup>2</sup>, VALERIJ KAPUSTNYK<sup>3</sup>,  
MYKOLA KRASNOSELSKYI<sup>4</sup>, KSENIIA ZUB<sup>5</sup>, ULRIKE WOITHA<sup>1</sup>, CECILE GONSCHOR<sup>1</sup>,  
and BEATRICE THIELMANN<sup>1</sup>

<sup>1</sup> Otto von Guericke University Magdeburg, Magdeburg, Germany  
Institute of Occupational Medicine, Faculty of Medicine

<sup>2</sup> Kharkiv National Medical University, Kharkiv, Ukraine  
Department of Hygiene and Ecology No. 2

<sup>3</sup> Kharkiv National Medical University, Kharkiv, Ukraine  
Department of Internal and Occupational Diseases

<sup>4</sup> National Academy of Medical Sciences of Ukraine, Kharkiv, Ukraine  
Grigoryev Institute of Medical Radiology and Oncology

<sup>5</sup> Kharkiv National Medical University, Kharkiv, Ukraine  
Department of Neurology

## Abstract

**Objectives:** Severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) pandemic and the military conflicts in Ukraine suggest that work-related stressors increased during these crises increases work-related stress reactions. Burnout as a long-term consequence of insufficiently compensated for workloads. The regional prevalence of burnout is particularly high among oncologists. The aim of this study was to assess the current risk of burnout within this group of physicians and to examine gender differences through gender-based analysis. **Material and Methods:** Thirty-seven oncologists (17 men and 20 women aged  $46.5 \pm 13.6$  years [range 26–74 years]) in Kharkiv, Ukraine, participated. The *Maslach Burnout Inventory – General Survey* (MBI-GS) questionnaire was used to determine the extent of occupational. **Results:** Gender, age, and work experience had no effect on the following results. Women demonstrated higher scores in emotional exhaustion and personal accomplishment of the MBI than men. In contrast, men offered higher cynicism scores. The MBI total score was also higher for the male oncologists. Only 1 person of the total sample had risk of burnout. **Conclusions:** The results showed a high prevalence of burnout symptoms among Ukrainian oncologists without gender differences. From occupational health perspective behavioral and behavior-preventive measures are needed for clinics and oncologists to counteract the Burnout symptoms, e.g. exhaustion or cynicism. Further studies are needed here to examine the effectiveness of these measures. *Int J Occup Med Environ Health.* 2023;36(6)

## Key words:

cancer, stress, burnout, physicians, crises, mental health

\* The authors contributed equally to the manuscript.

Funding: this research was supported by Ministry of Health of Ukraine (state registration No. 0121U110914 entitled “Substantiation of criteria of prepathological states of occupational burnout in health care workers,” manager: Igor Zavgorodnij).

Received: June 7, 2023. Accepted: September 18, 2023.

Corresponding author: Beatrice Thielmann, Otto von Guericke University Magdeburg, Institute of Occupational Medicine, Faculty of Medicine, Leipziger Str. 44, 39120 Magdeburg, Germany (e-mail: [beatrice.thielmann@med.ovgu.de](mailto:beatrice.thielmann@med.ovgu.de)).

## INTRODUCTION

Many physicians are generally exposed to high levels of psychological stress, which can lead to mental health impairments such as sleep disorders, burnout, or depression. Physicians have a higher risk of burnout compared to other occupational groups [1–7]. Burnout is defined as a syndrome characterized by emotional exhaustion, cynicism/depersonalization, and low sense of personal accomplishment [8]. The number of physically and emotionally overworked physicians worldwide is increasing [7,9,10]. Physicians report major occupational stresses due to bureaucratic duties in their daily medical practice, in governmental regulation, and in work compression. Medical staff wish for more time for their patients, greater autonomy, flexible work schedules, and a work environment that allows a good balance between family/private life and work [11]. Rapid scientific developments in diagnostics and therapy place significant demands on the medical profession, especially oncologists. The physicians' prioritization of patient care often leads to an inadequate focus on self-care that promotes their own health and well-being, which in turn could compromise the quality of care delivered to their patients [10,12].

Results of some surveys indicate a significant prevalence of burnout among oncology professionals [13–27]. However, the results widely varied [28–30] due to different methods being used to assess burnout risk, and the potential difference regarding the level of openness of respondents across countries. For example, Shanafelt et al. [29] showed that 44.7% U.S. oncologists (45.9% academic and 50.5% working in private practices) were burned out and showed high emotional exhaustion and/or depersonalization on the *Maslach Burnout Inventory* (MBI). In European regions, according to the new European Society for Medical Oncology (ESMO) burnout survey of oncologists <40 years old, the burnout rate was 71.4%, with the highest rate being observed in Central

Europe (84.2%) and the lowest rate in Northern Europe and British Isles (52.3%) [28]. In Japan, the lowest prevalence was reported, with 20.6% of radiation oncologists indicating a high risk of burnout [31].

A Medscape report from 2020 [32] of a sample of 15 181 physicians in the U.S. found satisfaction, and burnout occurred in approx. 1 in 3 oncologists (29%). Thus, satisfaction was in the middle range of physicians surveyed across all specialties. The prevalence of burnout syndrome among oncologists was 32%, while depression affected 4% and the combination of both affected 9%. Similar results were shown by physicians in other specialties. In this study, the oncologists also see the greatest stress responsible for burnout in many bureaucratic tasks (74%), many overtime hours/long working hours (42%), lack of appreciation or little respect from managers, supervisors, staff, and colleagues (36%), increasing computerization/digitalization in the practice (32%), and lack of control and autonomy (31%). Most oncologists (72%) who reported being depressed answered that they did not feel suicidal. However, nearly one-fifth of oncologists (18%) reported having had suicidal thoughts, while 1% reported having attempted suicide. Since suicidal thoughts and depressive symptoms can also affect burnout, burnout should be identified and intervened early. Stafford and Judd [14] found that one-third of oncology gynecologists surveyed (35.7%) suffered from severe emotional exhaustion, which is known to be a central component of burnout. In this sample from Australia, the most common source of stress (80.8%) was also reported to be disruption of personal life due to work. Compared to general population data, alcohol use was high among oncology respondents. This correlated with psychological morbidity, general workplace stress, and burnout. Other factors associated with burnout were administrative/organizational demands and high patient volume. More than half of the respondents (58.6%) reported being very satisfied with their jobs. Most had a high level of personal accomplishment (70.4%).

In another sample of gynecologic oncologists from Canada, the majority of physicians (92%) were satisfied with their work, although the professional profile of these physicians is predominantly clinical, with only a small component of administration [22]. Despite the high level of job satisfaction, clear concerns are expressed about system problems in health care. A bit more than 1 in 4 (about 26%) of physicians suffer from high stress, which is strongly associated with emotional exhaustion and high depersonalization. The 2 dimensions constitute 2 of the 3 major components of burnout. The group of gynecologic oncologists has been frequently studied in the context of burnout risk [26,33]. Murali and Banerjee [15] showed in their review article that burnout was a serious problem within oncologists. The authors suggest that burnout may have a negative impact on the well-being of oncologists and on the quality of care they provide to their cancer patients [15]. Negative effects on patient care have also been described, such as more frequent treatment errors, decreased empathy, altruism, and reduced patient satisfaction or trust [30]. Almost all studies emphasize that job-related burnout can also have serious personal and professional consequences [15,20]. The increasingly aging population and, as a result, the increase in cancer patients leads to the higher demand for care in this specialty and, correspondingly, a higher demand for oncologists [15]. The identified risk factors for burnout mainly include early career stage, increased workload, and poor work-life balance [30]. Several risk factors specific to this specialty are associated with increased susceptibility to developing burnout among oncologists [20]. Oncologists are confronted daily with life and death decisions for their cancer patients and grief much more frequently than physicians in other specialties. This constant management of serious cancers with limited, sometimes hopeless, curative outcomes, combined with the excessively long hours and increased administrative burden, as well as limited autonomy in daily tasks and numerous electronic documentation

requirements, appear to make oncologists more vulnerable to burnout.

In a systematic review and meta-analysis, one-third of oncologists (32% of 4876 oncologists) reported a high risk of burnout and one-fourth (27% of 2384 oncologists) reported high psychiatric morbidity [34]. It is suggested that high mortality of cancer patients and increasing numbers of patients with severe diseases may cause distress to oncologists due to high and emotionally stressful work situations. The studies assessed showed that 42–69% of oncologists felt stressed at work and >12% screened positive for depression. Many also suffer from sleep deprivation. Up to 30% of oncologists drink alcohol at problematic levels and up to 20% of young oncologists take hypnotics. Stress-induced complaints such as stomach problems, ulcers, headaches, and arrhythmias are also common among oncologists. Burnout is associated with many other factors [30], such as multiple chronic diseases [35,36], an increased risk of traffic accidents [37] and lower physical quality of life [38].

The activities of almost all physicians were strongly influenced by severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) pandemic. In a review, it was shown that the SARS-CoV-2 pandemic brought a significant impact on the stress levels of oncologists: psychological stress increased significantly in an alarming relatively short period of time [39]. Burnout prevalence increased from 38% to 49% [40]. Presumably, the pandemic has a compounding and cumulative effect on the mental health of oncology workers. It appears that some time will be needed to cope with the situation of the prolonged pandemic [39].

The SARS-CoV-2 pandemic had developed very rapidly. The information regarding transmission routes, the shortages of personal protective equipment in the early stages, new treatment methods, lack of vaccine at the beginning of the pandemic, followed by mandatory vaccination decisions for medical personnel, all this came to oncologists in a short period of time and physicians had a strug-

gled keeping up with these rapid developments. In addition, new and ever-changing public health guidelines and regulations continued to emerge [39].

Depending on the wave of the pandemic, stressors worry about changed, such as, in the first wave, concerns about contagion of oneself, of family members, and of one's cancer patients, as well as delays in patient treatment. Unfortunately, the literature lacks the research studies that thoroughly investigated the development of concerns among medical personnel in oncology in detail as well as the effects of public health guidelines on the mental health of oncology staff when considering the impact of the SARS-CoV-2 pandemic on medical professionals. In the context of the pandemic, changes in the work process included reductions in face-to-face interactions with patients, temporary assignments to other areas of the hospital (such as intensive care units so-called "front line"), lack of or inadequate access to personal protective equipment, cancellation of surgeries and other treatments due to overcrowding in intensive care units beds, increased workload, loss of autonomy due to stringent hospital hygiene protocols and government regulations, reduced job security, reduced income in some cases, reduction in research activities, and transition to changes in work schedules [39]. In addition, there was increased psychological distress, including depression and anxiety, feelings of lack of control and insecurity, guilt about not caring for patients and families as one would like, irritability and anger, post-traumatic stress symptoms, sleep disturbances, increased use of substances such as antidepressants, anti-anxiety medications, and sleep aids, significantly increased risk of burnout, and increased moral distress and moral injury [39].

During this pandemic period, stresses from the home also added up and changed significantly: children stayed at home, online school, need to organize and control the child's education, in some cases family separation was made in some countries for fear of contagion, decrease

in the quality of family relationships, reduced time for the family and for themselves personally, negative impact on personal relationships with material partner and children, increased childcare and housework, especially for women [39].

All these pandemic-related changes affected the mental health of oncologists. The majority of published studies over the past 3 years found a significant increase in psychological distress among oncology staff, particularly high anxiety for their own health and risk of infecting their own families with the SARS-CoV-2 [39]. Similar to pre-pandemic studies, being young (<40 years) and female were identified as risk factors for higher emotional distress [39]. Oncologists reported anxiety about their lack of preparation and/or protocols for managing patients with COVID-19 possibly affecting the well-being of their patients, especially those whose care was delayed because of the pandemic. Uncertainty about the length of the pandemic also led to anxiety. For example, 1 study showed that delay in the care of their patients during the pandemic was correlated with high levels of anxiety and burnout among physicians compared with physicians whose patients did not experience treatment delays [41]. Another study that examined emotional concerns among oncology physicians in the United States found that anxiety and depression were related to providing appropriate care to cancer patients [42].

In a cross-sectional study design, an internet-based survey of 121 oncologists was conducted in April–July 2020 using the *Oldenburg Burnout Inventory*, which includes items on exhaustion, disengagement, and burnout [43]. The survey of members of the Working Group of Internal Oncology in the German Cancer Society revealed a burnout prevalence in the pandemic period of 43.8%. This was found to be correlated with the age and professional experience of the oncologists. The prevalence is particularly high among younger oncologists. Exhaustion was strongly associated with employment status, with significantly higher levels

among employed oncologists. There was a remarkably low level of disengagement among oncologists, indicating their own aspirations to meet professional demands despite the impending or actual overload of their daily work [43]. In time of crisis in the last months in Ukraine, thus under the influence of the SARS-CoV-2 pandemic and the ongoing military conflicts, which also affects their own lives and those of their family members as well as patients in need of treatment, and the increasing absence of staff due to waves of doctors fleeing the country, the oncologists in Kharkiv continued to perform their work. This study addresses the mental health of Ukrainian oncologists in this new stressful situation. The aim of the study was to assess the current risk of burnout in this group of physicians and to analyze the results based on gender.

## MATERIAL AND METHODS

### Subjects

Thirty-seven oncologists (17 men and 20 women, aged 26–74 years) in Ukraine voluntarily participated in the occupational psychology survey. The average age of the respondents was  $46.5 \pm 13.6$  years. Oncology physicians included chemotherapists, oncologists, oncosurgeons, oncogynecologists, oncoradiologists, interventional radiologists, ENT oncologists, hematologists, and radiotherapists of the clinic of the state institution Grigoriev Institute for Medical Radiology of the National Academy of the Medical Sciences of Ukraine. The range of professional years as an oncologist was 2–50, with the average value being  $22.5 \pm 13.4$  years.

All interviews were conducted in agreement with the relevant ethics committee, in accordance with national legislation, and in accordance with the Declaration of Helsinki. All informed participants provided informed consent by completing the online questionnaire.

The survey was conducted in accordance with the requirements of bioethics approved at the meetings of the Committee on Ethics and Bioethics of Kharkiv National

Medical University, Ukraine, when planning the research (extract from Protocol No. 3 of August 28, 2020) and in accordance with the work plan for 2022 (extract from Protocol No. 3 of March 17, 2021).

### Time allocation of the study

The survey took place in June–September 2022 as an online survey (Google Forms), i.e., during the SARS-CoV-2 pandemic and during military conflict in Ukraine. In the study presented here, burnout was described among medical staff in oncology in Ukraine, who were exposed to both job-specific stressors and new stresses that arose in connection with the SARS-CoV-2 pandemic and combat operations on the territory of Ukraine at the time of the survey. The SARS-CoV-2 pandemic proved to be a particular professional challenge for oncologists worldwide, and the prevalence of burnout increased under pandemic conditions [39].

### Methodology

The *Maslach Burnout Inventory* (MBI-GS) questionnaire was used as a diagnostic tool to determine the extent of occupational burnout [8]. The procedure contains 16 statements about feelings associated with the performance of professional activities. The 3 burnout dimensions are assigned: emotional exhaustion, cynicism, and personal accomplishment. The statements are answered on a 7-point scale based on the frequency of occurrence of these feelings in the last 4 weeks and include response options from “never” (0 pts) to “daily” (6 pts). Subsequently, mean values are formed for the individual dimensions and these indicate the severity of the manifestation of the burnout dimension (“low”, “average” or “high”) (comparison Table 1) [44]. According to Maslach and Jackson [44], a burnout syndrome is suspected if the dimensions emotional exhaustion and cynicism are high and the dimension personal accomplishment is low. Thus, this instrument maps the long-term psychological stress consequences.

**Table 1.** Frequency of the *Maslach Burnout Inventory* (MBI) dimensions according to expression and gender of oncologists, June–September 2022, Kharkiv, Ukraine

MBI dimension	Participants (N = 37) [n (%)]			p
	men (N = 17)	women (N = 20)	total	
Emotional exhaustion <sup>a</sup>				0.082
low ( $\leq 2.00$ pts)	12 (70.6)	11 (55.0)	23 (62.2)	
average (2.01–3.19 pts)	4 (23.5)	2 (10.0)	6 (16.2)	
high ( $\geq 3.20$ pts)	1 (5.9)	7 (35.0)	8 (21.6)	
Cynicism <sup>a</sup>				0.797
low ( $\leq 1.00$ pts)	7 (41.2)	9 (45.0)	16 (43.2)	
average (1.01–2.19 pts)	5 (29.4)	7 (35.0)	12 (32.4)	
high ( $\geq 2.20$ pts)	5 (29.4)	4 (20.0)	9 (24.3)	
Personal accomplishment <sup>a</sup>				0.086
low ( $\leq 4.00$ pts)	7 (41.2)	2 (10.0)	9 (24.3)	
average (1.01–2.19 pts)	2 (11.8)	3 (15.0)	5 (13.5)	
high ( $\geq 2.20$ pts)	8 (47.1)	15 (75.0)	23 (62.2)	
Burnout risk <sup>b</sup>				0.457
no burnout (0–1.49 pts)	8 (47.1)	12 (60.0)	20 (54.1)	
some burnout symptoms (1.5–3.49 pts)	8 (47.1)	8 (40.0)	16 (43.2)	
burnout risk (3.5–6.00 pts)	1 (5.9)	0 (0)	1 (2.7)	

<sup>a</sup> Pearson's  $\chi^2$ .

<sup>b</sup> Fisher exact test.

For the supplementary determination of the burnout risk according to the classification of Kalimo et al. [45] this last dimension LF is reversed into the “reduction of personal accomplishment” (redLF), then the mean value of each dimension is multiplied by the determined factor and finally the weighted categories are added up. The calculation is based on this formula:

$$\text{Burnout risk} = (0.4 \times \text{EE}) + (0.3 \times \text{ZY}) + (0.3 \times \text{redLF}) \quad (1)$$

where:

EE – emotional exhaustion,

ZY – cynicism/depersonalization,

redLF – reduction of personal accomplishment.

This results in a score that can be classified into 3 outcome categories: “no burnout,” “some burnout symptoms,” and “burnout risk” (Table 1).

### Statistical analysis

The statistical processing and analysis of the data material was carried out using the software package IBM SPSS Statistics 26. First, frequency analyses were carried out for the total sample with additional collection of descriptive characteristic values such as mean (M) and standard deviation (SD) as well as median (Me) with associated minimum (min.) and maximum (max), then the 95% confidence intervals (CI) were calculated. Variables were tested for normal distribution using the Shapiro-Wilk test before



mean differences between 2 gender groups were analyzed. The significance level used in the calculation for the mean differences in the Mann-Whitney test was 5%. For frequency analyses and cross-tabulations, the Pearson's  $\chi^2$  test was used for minimum expected frequencies <5% and Fisher's exact test for minimum expected frequencies <5%, respectively. Results from the MBI questionnaire were analyzed for correlations with sociodemographic data (age, years of occupation) using Spearman's correlation analysis.

## RESULTS

The sociodemographic data of the total sample of 37 oncologists and 2 genders are shown in Table 2. The age of the 17 physicians was  $M \pm SD$  47.5  $\pm$  13.58 years. Twenty female physi-

cians were slightly younger ( $M \pm SD$  45.7  $\pm$  13.85 years), but these age differences were not statistically significant ( $p = 0.703$ ). Accordingly, oncologists had almost 2 years more professional experience than their female colleagues (23.5 years vs. 21.6 years), although these differences could also not be confirmed statistically ( $p = 0.819$ ).

The descriptive results of the MBI data collection can be seen in Table 3. For this purpose, the subscales: *Emotional Exhaustion*, *Cynicism*, and *Personal Accomplishment* were examined in both gender groups. There are no significant differences in the mean scores in the respective MBI dimension. The mean scores of the total sample in the category emotional exhaustion with  $M \pm SD$  1.94  $\pm$  1.736 pts are in the range of low expression

**Table 2.** Sociodemographic of 2 gender groups and the total sample of oncologists, June–September 2022, Kharkiv, Ukraine

Variable	Participants (N = 37)						p <sup>a</sup>
	men (N = 17)		women (N = 20)		total		
	M $\pm$ SD	Me (min.–max)	M $\pm$ SD	Me (min.–max)	M $\pm$ SD	Me (min.–max)	
Age [years]	47.5 $\pm$ 13.58	42 (32–74)	45.7 $\pm$ 13.85	46.5 (26–69)	46.5 $\pm$ 13.57	45 (26–74)	0.703
Professional years [years]	23.5 $\pm$ 13.69	20 (9–50)	21.6 $\pm$ 13.41	22 (2–50)	22.5 $\pm$ 3.38	20 (2–50)	0.819

<sup>a</sup> Mann-Whitney U test.

**Table 3.** Maslach Burnout Inventory (MBI) dimensions in the gender groups and the total sample of oncologists, June–September 2022, Kharkiv, Ukraine

MBI dimension	Participants (N = 37)								p <sup>a</sup>
	men (N = 17)			women (N = 20)			total		
	M $\pm$ SD	Me (min.–max)	95% CI	M $\pm$ SD	Me (min.–max)	95% CI	M $\pm$ SD	Me (min.–max)	
Emotional exhaustion	1.59 $\pm$ 1.532	1.40 (0–5.8)	0.80–2.38	2.24 $\pm$ 1.878	1.80 (0–5.4)	1.36–3.12	1.94 $\pm$ 1.736	1.6 (0–5.8)	0.306
Cynicism	1.67 $\pm$ 1.478	1.40 (0–5.0)	0.91–2.43	1.43 $\pm$ 1.081	1.2 (0.2–4.0)	0.92–1.94	1.54 $\pm$ 1.266	1.2 (0–5)	0.818
Personal accomplishment	4.16 $\pm$ 1.864	4.83 (1–6)	3.20–5.12	5.38 $\pm$ 0.653	5.58 (4–6)	5.07–5.68	4.82 $\pm$ 1.466	5.5 (1–6)	0.100
Total score	1.69 $\pm$ 1.129	1.65 (0–3.66)	1.11–2.27	1.51 $\pm$ 1.00	1.25 (0.14–3.44)	1.04–1.98	1.59 $\pm$ 1.05	1.34 (0–3.66)	0.615

<sup>a</sup> Mann-Whitney U test.

( $\leq 2.00$  pts) of this category. The dimension cynicism of the 37 oncologists with the  $M \pm SD$   $1.54 \pm 1.266$  pts was in the lower average range (1.01–2.19). The personal accomplishment of the total sample was also average: with the value of  $M \pm SD$   $4.82 \pm 1.466$ , which was between 4.01–4.99 pts (“average” expression). The parameter from the risk calculation for a burnout syndrome (MBI total score) was in the range of “some burnout syndromes” (1.5–3.49) with the value of  $M \pm SD$   $1.59 \pm 1.05$  pts according to the burnout risk classification by Kalimo et al. [45]. Using MBI, statements were made about the expression of 3 dimensions of burnout (Table 1) and about the burnout risk (Table 1) of the oncologists. For all 3 dimensions: emotional exhaustion, cynicism and personal accomplishment, no significant gender difference could be found ( $p > 0.05$ ), although there was a tendency for women to have a higher proportion of respondents with the high expression of emotional exhaustion (35.0%) than men (5.9%) (Table 1). Overall, every fifth participant has a high expression of emotional exhaustion (21.6%). Every fourth respondent (24.3%) has high expression of the cynicism dimension (Table 1).

The high expression of capability (Table 1) was shown by 62.2% of the oncologists of the total sample, and low expression was shown by 24.3% of the respondents. There was a tendency ( $p = 0.086$ ) for the proportion of women with a high expression of personal accomplishment to be high within this gender group at 75.0%. Only every second male colleague estimated his personal accomplishment as high (47.1%). A low level of personal accomplishment was demonstrated by 41.2% of the men.

There were no gender-specific effects regarding the risk of burnout according to Kalimo et al. ( $p = 0.457$ ) [45]. In the total sample, the risk of burnout was 2.7% and the proportion of oncologists with some burnout symptoms was 43.2% (Table 1). Accordingly, almost 1 in 2 oncologists had some or pronounced burnout symptoms. The proportion of oncologists who did not show burnout symptoms

was higher in the female gender group than in the male gender group (60.0% vs. 47.1%).

The age and the number of years in the profession correlate only with the dimension emotional exhaustion ( $\rho = -0.355$  at  $p < 0.01$  and  $\rho = -0.378$  at  $p < 0.01$ , respectively), but not with the other MBI dimensions.

## DISCUSSION

The prevalence of burnout has been reported to be alarmingly high across various professions, with the medical field showing an upward trend in burnout risk among its personnel. Prevalence rates of burnout among physicians in Germany vary from 4–20% [46]. International studies report the risk of burnout in this professional group ranging from 20.6% in Japan to 84.2% in Central Europe [28,31]. This is related to their occupation, which involves a high proportion of interactional labor. International studies have shown that oncologists are exposed to increased job strain and work-related stress [47], which may be associated with negative health-related stress consequences, including burnout [48].

Unfortunately, due to the fact that the oncologists in Kharkiv were only surveyed once during the pandemic, this study from Ukraine cannot analyze pandemic-related changes. Thus, it cannot be clearly stated how the pandemic itself and/or how the ongoing military conflict affected the mental health of the oncologists. To determine whether the significant increase in mental stress among oncology personnel occurred and influenced the burnout risk could only be surmised based on other international studies conducted over the past 3 years. The results of this study provide information on the mental health of Ukrainian oncologists during these new stressful situations.

In the total sample from Ukraine, according to Kalimo et al. [45], the burnout risk was 2.7% among oncologists, and the proportion with some burnout symptoms was 43.2%. The prevalence of 45.9% was within the middle range of the global data. In the spring of 2021,



a survey was conducted among the physicians of anesthesiology and intensive care in the same hospital in Kharkiv. The results showed that the risk of burnout (2.7%) and the prevalence of some symptoms (74.0%) among the 73 respondents were much higher than those observed among the oncologists surveyed a year later [49]. The prevalence among physicians in anesthesia and intensive care was about 25–50% in the pre-pandemic period, again very differentiated data can be found in international studies [2,6].

A detailed analysis of the different manifestations of each burnout dimension among the examined oncologists reveals that, on average, they exhibit lower levels of emotional exhaustion, and average levels of cynicism and personal accomplishment. It is difficult to compare these data with the results of other international studies, since in some cases different questionnaires were used or different versions of the MBI questionnaire were employed. In the survey by Böckelmann et al. [49] who used the same version of the MBI questionnaire, the 73 Ukrainian physicians of anesthesiology and intensive care had higher mean scores on the dimension emotional exhaustion ( $M \pm SD$  2.20  $\pm$  1.426 pts) and cynicism ( $M \pm SD$  1.82  $\pm$  1.245 pts). Personal accomplishment of intensivists with  $M \pm SD$  3.72  $\pm$  1.919 pts was more limited compared to Ukrainian oncologists. Correspondingly, the MBI total score according to Kalimo et al. [45] was also higher at  $M \pm SD$  2.11  $\pm$  0.881, indicating a higher risk of burnout among intensivists compared to the oncologists in this study. It may be that oncologists perceive a special resource in their work: positive personal contacts with their cancer patients. In a survey of oncologists in Germany, they particularly value the intensive relationship with their seriously ill patients, the appreciation of their work by patients and their family members, as well as their contribution to coping with serious illnesses [50].

Nevertheless, the number of individuals at risk of burnout is high in both Ukrainian samples examined and

requires intervention measures for oncology and critical care physicians to minimize the risk of burnout.

In the sample studied here, which was very small, no significant gender differences were found for all 3 dimensions of emotional exhaustion, cynicism, and personal accomplishment. Whether the tendency of the higher proportion of female oncologists with a high level of emotional exhaustion in the larger samples compared to the men can be confirmed needs further investigation. In a longitudinal study conducted in ten German federal states, differences in the perception of the 2 genders were seen as an explanation for the manifestation of burnout: in men, it was more related to depersonalization (they pay more attention to individual and cognitive factors) and in women, it was more related to emotional exhaustion (collective and emotional factors are more important for them) [51]. The men are mostly raised and trained to be strong and to deny negative feelings as well as emotions while preparing their professional career. Based on these differences, it would make sense to design preventive measures for shaping the work environment and for dealing with chronic stressors in a gender-specific manner and to take this into account when selecting interventions [52]. When considering gender-specific aspects of burnout, many aspects should be considered: different physiological reactions in response to stressors and stressful work situations and interaction of psychological factors in connection with social inequalities in working life and acquired role models as well as the much more frequent multiple stress of women.

Every fifth oncologist participating in this study had a high expression of emotional exhaustion and every fourth had a high expression of the dimension cynicism. this problem needs to be addressed on a societal level of the organization (e.g., examining the goal definitions of employees) as well as of the individual (e.g., setting realistic goals for oneself). Personal resources (the so-called self-efficacy expectation) should be strengthened and

improved, e.g., realistic perception, flexibility, creativity, will, perseverance, self-confidence [52]. Comparing these levels of expression of the MBI dimension emotional exhaustion of the oncologists with the Ukrainian intensivists from the study by Böckelmann et al. [49], similar results emerged. Every fifth intensive care physician was highly emotionally exhausted, but the proportion of physicians with a high degree of cynicism was much higher, almost 40%, than among oncologists, 24.3%. A quarter of the surveyed oncologists show a low level of personal accomplishment, with the proportion of men with low expression of personal accomplishment within this gender group being significantly higher (41.2%) than female colleagues (10.0%). These results of the surveyed oncologists compared to those of the intensivists examined by Böckelmann et al. [49] were significantly better: every fourth oncologist had lower personal accomplishment, whereas this was the case for every second intensivist (49.3%).

The largest burnout survey of European young oncologists makes it clear that burnout is widespread in this professional group [28]. Achieving a good work-life balance, access to support services (support service), and adequate leave time can reduce burnout levels. Raising awareness about burnout in oncology, providing support for those affected, and conducting intervention research are still necessary in this field. The international research studies that have addressed burnout risk among oncology physicians have proposed and partially evaluated individually targeted and/or organizational intervention measures to minimize risk [13,15,34]. Job-related stress decreases professional satisfaction, affects patient care, increases risk of medical errors, increases staff turnover, and increases the chances of oncologists switching to another medical specialty [13]. In the time of physician shortage, special attention should be paid to the satisfaction and mental and physical health status of oncologists. Incapacity, early retirement or change of profession

should be avoided. To counteract these, changes would have to be made primarily to the working conditions (organizational measures) and personal resources would also have to be strengthened. Therefore, future research is called upon to establish and evaluate appropriate interventions [34].

Organizations (e.g., hospitals) and health care payers have opportunities to incorporate preventive strategies to address the problem in everyday operations to reduce burnout risk [22]. To do so, they must consider the factors influencing the risk for burnout in oncology. Job-related factors that increase the risk of burnout include longer working hours, increased administrative workload, high patient volume, time pressure, reduced self-determination, limited freedom to act and make decisions, and stressful work situations and unclear career prospects [30]. One possibility is to implement measures in the area of communication (shared decision making) and changes in working conditions (working time regulations) [17]. Job satisfaction is crucial not only for the physician's quality of life and for patient care, but also for the health care organization in which physicians work [13].

Employees can also take steps themselves to promote personal well-being and job satisfaction [20]. Self-observance of a work-life balance, in which they do not take work home with them, adequate leisure time, and balancing personal and professional life are some examples. Demographic factors can also increase burnout risk. These include younger age, lower career stage, social isolation, and country of occupation [30].

Mindfulness-based interventions for individuals with burnout could serve as a potential preventive intervention [30]. Earlier prevention is important to prevent oncologists from developing a high risk of burnout and becoming ill in the first place. Physicians at risk for burnout are very likely to be absent from cancer patient care due to their health impairments.

The Medscape report from 2020 [32] shows that about half of oncologists use exercise (51%) or talking to their family members and friends (49%) as coping strategies to deal with their burnout. Other strategies include isolation (38%), sleep (37%), drinking alcohol (26%), or playing/listening to music (24%), illustrating the diversity of coping mechanisms among physicians. Because alcohol use is associated with burnout risk, efforts should be made to reduce the risk for alcohol abuse [53].

According to the Medscape report [32], when asked if oncologists planned to seek help for depression, 60% of oncologists answered in the negative and had not sought professional care in the past. Seventeen percent of oncologists surveyed were seeking professional help for their depression disorder or burnout during the survey, and 7% planned to seek it. Ten percent of oncologists answered: "No but have received professional care in the past." The 2 main reasons that prevent oncologists from seeking help for their burnout and depression are that they do not consider their symptoms severe enough and feel that they could handle it on their own, without professional help (48%). Thirty-six percent of oncologists reported being too busy to take care of their own health, 15% of respondents do not want to disclose their health problems. More than 1 in 10 of the respondents (12%) do not trust psychiatrists. Fifty-seven percent of oncologists surveyed take 3–4 weeks of leave annually, 5–6 weeks was reported by 10% and 1–2 weeks by 24% of oncologists. One-third of oncologists (29%) reported that they usually have time to focus on their health and wellness goals on a regular basis. Only 4% always take care of their health. However, for the majority ("sometimes" – 45% and "rarely" – 20%), it is a struggle to balance this with the workload and commitment they carry as physicians.

In the German Working Condition in Oncology study [50] which investigated whether and to what extent the working conditions of practicing hematologists and oncologists in Germany affect their health, fatigue, back and neck pain, and an excessive need for sleep were the most

common complaints. Respondents rarely stay at home when experiencing health complaints [50]. Thirty-eight percent of physicians go to work even when they feel ill. The study by Bui et al. [13] showed that effective strategies for personal health promotion should be integrated into routine oncologic care to prevent and treat burnout. More support is needed to reduce occupational stress in health care. To ensure the quality of medical care, preventive mental health services should be offered to employees early in their careers [43,54]. First, however, a survey of the status quo is necessary. This can be done in the form of a risk assessment. This is not only anchored in the law in Germany [55] but also agreed at the level of the European Union (EU) [56]. Since Ukraine is striving to join the EU, occupational health and safety measures are worth striving for.

## CONCLUSIONS

High prevalence of burnout symptoms such as emotional exhaustion and/or cynicism among Ukrainian oncologists requires behavioral and behavioral preventive measures for clinics and oncologists to counteract the possibility of long-term illness and absenteeism. Gender differences were not found. This would be possible within the framework of occupational health precautions. Occupational health and safety measures are especially needed in Ukraine's ambitions to integrate into the European Union. Positive effects of these health promotion measures have yet to be evaluated in studies.

## ACKNOWLEDGMENTS

The authors thank Ms. Nancy Beyer for assistance in inputting the data. The authors thank the physicians for participating in the study during the crisis-ridden times.

## Author contributions

**Research concept:** Irina Böckelmann, Igor Zavgorodnij, Olena Litovchenko, Valerij Kapustnyk, Mykola Krasnoselskyi

**Research methodology:** Irina Böckelmann, Igor Zavgorodnij, Olena Litovchenko, Valerij Kapustnyk, Mykola Krasnoselskyi, Kensiia Zub, Beatrice Thielmann

**Collecting material:** Irina Böckelmann, Igor Zavgorodnij, Olena Litovchenko, Mykola Krasnoselskyi, Kensiia Zub, Ulrike Woitha, Cecile Gonschor

**Statistical analysis:** Irina Böckelmann, Igor Zavgorodnij, Ulrike Woitha, Cecile Gonschor, Beatrice Thielmann

**Interpretation of results:** Irina Böckelmann, Igor Zavgorodnij, Ulrike Woitha, Cecile Gonschor, Beatrice Thielmann

**References:** Irina Böckelmann, Beatrice Thielmann

## REFERENCES

1. Wright AA, Katz IT. Beyond Burnout – Redesigning Care to Restore Meaning and Sanity for Physicians. *N Engl J Med.* 2018;378:309–11. <https://doi.org/10.1056/NEJMp1716845>.
2. Chuang C-H, Tseng P-C, Lin C-Y, Lin K-H, Chen Y-Y. Burnout in the intensive care unit professionals: A systematic review. *Medicine (Baltimore).* 2016;95:e5629. <https://doi.org/10.1097/MD.0000000000005629>.
3. De Oliveira GS, Ahmad S, Stock MC, Harter RL, Almeida MD, Fitzgerald PC, et al. High incidence of burnout in academic chairpersons of anesthesiology: should we be taking better care of our leaders? *Anesthesiology.* 2011;114:181–93. <https://doi.org/10.1097/ALN.0b013e318201cf6c>.
4. Hyman SA, Michaels DR, Berry JM, Schildcrout JS, Mercaldo ND, Weinger MB. Risk of burnout in perioperative clinicians: a survey study and literature review. *Anesthesiology.* 2011;114:194–204. <https://doi.org/10.1097/ALN.0b013e318201ce9a>.
5. Kinzl JF, Traweger C, Biebl W, Lederer W. Burnout und Belastungsstörungen bei Intensivmedizinern. *J. Dtsch Med Wochenschr.* 2006;131:2461–4. <https://doi.org/10.1055/s-2006-955030>. German.
6. Heinke W, Dunkel P, Brähler E, Nübling M, Riedel-Heller S, Kaisers UX. [Burn-out in der Anästhesie und Intensivmedizin: Gibt es ein Problem in Deutschland?]. *Anaesthesist.* 2011;60:1109–18. <https://doi.org/10.1007/s00101-011-1947-3>. German.
7. Dyrbye LN, Burke SE, Hardeman RR, Herrin J, Wittlin NM, Yeazel M, et al. Association of Clinical Specialty With Symptoms of Burnout and Career Choice Regret Among US Resident Physicians. *JAMA.* 2018;320:1114–30. <https://doi.org/10.1001/jama.2018.12615>.
8. Maslach C, Jackson SE. The measurement of experienced burnout. *J. Organiz. Behav.* 1981;2:99–113. <https://doi.org/10.1002/job.4030020205>.
9. Marburger Bund [Internet], Berlin: MB-Monitor 2015. [cited 2023 Mar 31]. Available from: <https://www.marburger-bund.de/sites/default/files/files/2018-09/mb-monitor-2015-zusammenfassung-pk.pdf>. German.
10. Richter-Kuhlmann E. Arztgesundheit: Selbstfürsorge kommt zu kurz. *Dtsch Arztebl International.* 2019;116:[4]. German.
11. Apobank [Internet], Düsseldorf: Inside Heilberuf - Werte, Ziele, Wünsche [cited 2023 Mar 31]. Available from: <https://newsroom.apobank.de/documents/inside-heilberuf-werte-ziele-wuensche-85806>.
12. Thomas LR, Ripp JA, West CP. Charter on Physician Well-being. *JAMA.* 2018;319:1541–2. <https://doi.org/10.1001/jama.2018.1331>.
13. Bui S, Pelosi A, Mazzaschi G, Tommasi C, Rapacchi E, Camisa R, et al. Burnout and Oncology: an irreparable paradigm or a manageable condition? Prevention strategies to reduce Burnout in Oncology Health Care Professionals. *Acta Biomed.* 2021;92:e2021091. <https://doi.org/10.23750/abm.v92i3.9738>.
14. Stafford L, Judd F. Mental health and occupational wellbeing of Australian gynaecologic oncologists. *Gynecol Oncol.* 2010;116:526–32. <https://doi.org/10.1016/j.ygyno.2009.10.080>.
15. Murali K, Banerjee S. Burnout in oncologists is a serious issue: What can we do about it? *Cancer Treat Rev.* 2018;68:55–61. <https://doi.org/10.1016/j.ctrv.2018.05.009>.
16. Cañadas-De la Fuente, Guillermo A, Gómez-Urquiza JL, Ortega-Campos EM, Cañadas GR, Albendín-García L, De la Fuente-Solana, Emilia I. Prevalence of burnout syndrome in oncology nursing: A meta-analytic study. *Psychooncology.* 2018;27:1426–33. <https://doi.org/10.1002/pon.4632>.

17. Wörlner F, Gieseler F. Depersonalisation als Dimension des Burn-out-Syndroms bei Onkologen. *Forum*. 2020;35:376–8. <https://doi.org/10.1007/s12312-020-00809-9>.
18. Burki TK. Oncologists burnout in the spotlight. *Lancet Oncol*. 2018;19:e238. [https://doi.org/10.1016/S1470-2045\(18\)30275-4](https://doi.org/10.1016/S1470-2045(18)30275-4).
19. Alabi RO, Hietanen P, Elmusrati M, Youssef O, Alman-gush A, Mäkitie AA. Mitigating Burnout in an Oncological Unit: A Scoping Review. *Front Public Health*. 2021;9:677915. <https://doi.org/10.3389/fpubh.2021.677915>.
20. Copur MS. Burnout in Oncology. *Oncology (Williston Park)*. 2019;33.
21. Eelen S, Bauwens S, Baillon C, Distelmans W, Jacobs E, Ver-zelen A. The prevalence of burnout among oncology pro-fessionals: oncologists are at risk of developing burnout. *Psychooncology*. 2014;23:1415–22. <https://doi.org/10.1002/pon.3579>.
22. Elit L, Trim K, Mand-Bains IH, Sussman J, Grunfeld E. Job satisfaction, stress, and burnout among Canadian gynecologic oncologists. *Gynecol Oncol*. 2004;94:134–9. <https://doi.org/10.1016/j.ygyno.2004.04.014>.
23. Hlubocky FJ, Rose M, Epstein RM. Mastering Resilience in Oncology: Learn to Thrive in the Face of Burnout. *Am Soc Clin Oncol Educ Book*. 2017;37:771–81. [https://doi.org/10.1200/EDBK\\_173874](https://doi.org/10.1200/EDBK_173874).
24. Lee Y-G, Maeng CH, Kim DY, Kim B-S. Perspectives on Pro-fessional Burnout and Occupational Stress among Medical Oncologists: A Cross-sectional Survey by Korean Society for Medical Oncology (KSMO). *Cancer Res Treat*. 2020;52:1002–9. <https://doi.org/10.4143/crt.2020.190>.
25. Pittaka M, Sakellakis M, Metaxas V, Kardamakis D, Wa-gland R. Burnout Syndrome among Doctors in Greek Oncol-ogy Departments. *Iran J Psychiatry*. 2022;17:162–76. <https://doi.org/10.18502/ijps.v17i2.8906>.
26. Rath KS, Huffman LB, Phillips GS, Carpenter KM, Fowler JM. Burnout and associated factors among members of the So-ciety of Gynecologic Oncology. *Am J Obstet Gynecol*. 2015;213:824.e1-9. <https://doi.org/10.1016/j.ajog.2015.07.036>.
27. Shanafelt T, Dyrbye L. Oncologist burnout: causes, conse-quences, and responses. *J Clin Oncol*. 2012;30:1235–41. <https://doi.org/10.1200/JCO.2011.39.7380>.
28. Banerjee S, Califano R, Corral J, Azambuja E de, Mattos-Ar-ruda L de, Guarneri V, et al. Professional burnout in Euro-pean young oncologists: results of the European Society for Medical Oncology (ESMO) Young Oncologists Committee Burnout Survey. *Ann Oncol*. 2017;28:1590–6. <https://doi.org/10.1093/annonc/mdx196>.
29. Shanafelt TD, Gradishar WJ, Kosty M, Satele D, Chew H, Horn L, et al. Burnout and career satisfaction among US oncologists. *J Clin Oncol*. 2014;32:678–86. <https://doi.org/10.1200/JCO.2013.51.8480>.
30. Murali K, Makker V, Lynch J, Banerjee S. From Burnout to Re-silience: An Update for Oncologists. *Am Soc Clin Oncol Educ Book*. 2018;38:862–72. [https://doi.org/10.1200/EDBK\\_201023](https://doi.org/10.1200/EDBK_201023).
31. Mampuya WA, Matsuo Y, Nakamura A, Hiraoka M. Evalu-ation of the prevalence of burnout and psychological mor-bidity among radiation oncologist members of the Kyoto Radiation Oncology Study Group (KROSG). *J Radiat Res*. 2017;58:217–24. <https://doi.org/10.1093/jrr/rrw094>.
32. Medscape [Internet], Newark. Oncologist Lifestyle, Happi-ness and Burnout Report 2020. [cited 2023 Mar 31]. Avail-able from: <https://www.medscape.com/slideshow/2020-life-style-oncologist-6012471>.
33. Cass I, Duska LR, Blank SV, Cheng G, duPont NC, Freder-ick PJ, et al. Stress and burnout among gynecologic oncol-ogists: A Society of Gynecologic Oncology Evidence-based Review and Recommendations. *Gynecol Oncol*. 2016;143:421–7. <https://doi.org/10.1016/j.ygyno.2016.08.319>.
34. Medisaukaite A, Kamau C. Prevalence of oncologists in dis-tress: Systematic review and meta-analysis. *Psychooncol-ogy*. 2017;26:1732–40. <https://doi.org/10.1002/pon.4382>.
35. Hlubocky FJ, Back AL, Shanafelt TD. Addressing Burnout in Oncology: Why Cancer Care Clinicians Are At Risk, What Individuals Can Do, and How Organizations Can Respond. *Am Soc Clin Oncol Educ Book*. 2016;35:271–9. [https://doi.org/10.1200/EDBK\\_156120](https://doi.org/10.1200/EDBK_156120).



36. Shanafelt TD, Sloan JA, Habermann TM. The well-being of physicians. *Am J Med.* 2003;114:513–9. [https://doi.org/10.1016/s0002-9343\(03\)00117-7](https://doi.org/10.1016/s0002-9343(03)00117-7).
37. West CP, Tan AD, Shanafelt TD. Association of resident fatigue and distress with occupational blood and body fluid exposures and motor vehicle incidents. *Mayo Clin Proc.* 2012; 87:1138–44. <https://doi.org/10.1016/j.mayocp.2012.07.021>.
38. Kuerer HM, Eberlein TJ, Pollock RE, Huschka M, Baile WF, Morrow M, et al. Career satisfaction, practice patterns and burnout among surgical oncologists: report on the quality of life of members of the Society of Surgical Oncology. *Ann Surg Oncol.* 2007;14:3043–53. <https://doi.org/10.1245/s10434-007-9579-1>.
39. Granek L, Nakash O. Oncology Healthcare Professionals' Mental Health during the COVID-19 Pandemic. *Curr Oncol.* 2022;29:4054–67. <https://doi.org/10.3390/curroncol29060323>.
40. Lim KHJ, Murali K, Kamposioras K, Punie K, Oing C, O'Connor M, et al. The concerns of oncology professionals during the COVID-19 pandemic: results from the ESMO Resilience Task Force survey II. *ESMO Open.* 2021;6:100199. <https://doi.org/10.1016/j.esmoop.2021.100199>.
41. Yao KA, Attai D, Bleicher R, Kuchta K, Moran M, Boughey J, et al. Covid-19 related oncologist's concerns about breast cancer treatment delays and physician well-being (the CROWN study). *Breast Cancer Res Treat.* 2021;186:625–35. <https://doi.org/10.1007/s10549-021-06101-1>.
42. Thomaier L, Teoh D, Jewett P, Beckwith H, Parsons H, Yuan J, et al. Emotional health concerns of oncology physicians in the United States: Fallout during the COVID-19 pandemic. *PLoS One.* 2020;15:e0242767. <https://doi.org/10.1371/journal.pone.0242767>.
43. Heläß M, Haag GM, Bankstahl US, Gencer D, Maatouk I. Burnout among German oncologists: a cross-sectional study in cooperation with the Arbeitsgemeinschaft Internistische Onkologie Quality of Life Working Group. *J Cancer Res Clin Oncol.* 2023;149:765–77. <https://doi.org/10.1007/s00432-022-03937-y>.
44. Maslach C, Jackson SE, Leiter MP, editors. *The Maslach Burnout Inventory: Test Manual.* Palo Alto, CA: Consulting Psychologists Press; 1996.
45. Kalimo R, Pahkin K, Mutanen P, Topipinen-Tanner S. Staying well or burning out at work: Work characteristics and personal resources as long-term predictors. *Work and Stress.* 2003;17:109–22. <https://doi.org/10.1080/0267837031000149919>.
46. Beschoner P, Limbrecht-Ecklundt K, Jerg-Bretzke L. *Psychische Gesundheit von Ärzten : Burnout, Depression, Angst und Substanzgebrauch im Kontext des Arztberufes.* *Nervenarzt.* 2019;90:961–74. <https://doi.org/10.1007/s0015-019-0739-x>. German.
47. Grunfeld E, Zitzelsberger L, Coristine M, Whelan TJ, Aspelund F, Evans WK. Job stress and job satisfaction of cancer care workers. *Psychooncology.* 2005;14:61–9. <https://doi.org/10.1002/pon.820>.
48. Sherman AC, Edwards D, Simonton S, Mehta P. Caregiver stress and burnout in an oncology unit. *Palliat Support Care.* 2006;4:65–80. <https://doi.org/10.1017/s1478951506060081>.
49. Böckelmann I, Zavgorodnii I, Litovchenko O, Kapustnyk V, Thielmann B. Berufliche Gratifikationskrisen, Verausgabungsneigung und Burnout bei ukrainischen Anästhesisten und Intensivmedizinern während der SARS-CoV-2-Pandemie. *Zentralbl Arbeitsmed Arbeitsschutz Ergon.* 2023;73:64–74. <https://doi.org/10.1007/s40664-022-00492-8>. German.
50. Ansmann L, Nitzsche A, Neumann M. Niedergelassene Hämatologen und Onkologen: Gestresst, aber zumeist zufrieden. *Dtsch Arztebl International.* 2014;111:A-262-A-264. German.
51. Schmitz GS. Kann Selbstwirksamkeitserwartung Lehrer von Burnout schützen? Eine Längsschnittstudie in zehn Bundesländern. *Psychologie in Erziehung und Unterricht.* 2001;48:49–67. German.
52. Lalouschek W, Kainz B. Geschlechtsspezifische Aspekte von Burnout. *Blickpunkt der Mann.* 2008;6:6–12. German.
53. Ponocny-Seliger E, Winker R. 12-Phasen-Burnout-Screening. *ASU Arbeitsmed Sozialmed Umweltmed.* 2014;49:927-935. German.



54. Maricuțoiu LP, Sava FA, Butta O. The effectiveness of controlled interventions on employees' burnout: A meta-analysis. *J Occup Organ Psychol*. 2016;89:1–27. <https://doi.org/10.1111/joop.12099>.
55. Bundesministerium der Justiz [Internet]. Berlin: §5 Beurteilung der Arbeitsbedingungen – Gesetz über die Durchführung von Maßnahmen des Arbeitsschutzes zur Verbesserung der Sicherheit und des Gesundheitsschutzes der Beschäftigten bei der Arbeit (Arbeitsschutzgesetz – ArbSchG). [cited 2023 mar 12]. Available from: [https://www.gesetze-im-internet.de/arbschg/\\_\\_5.html](https://www.gesetze-im-internet.de/arbschg/__5.html).
56. Kampl G, Kastner H. Psychischer Arbeitnehmerschutz in der EU – Eine umfassende Überblicksstudie über rechtliche Rahmenbedingungen und eingesetzte Instrumente [Internet]. Wien: Institut zur Evaluierung psychischer Belastungen am Arbeitsplatz; 2017 [cited 2024 Mar 12]. Available form: [https://www.iepb.at/wp-content/uploads/2018/02/Psychischer\\_Arbeitnehmerschutz\\_in\\_der\\_EU\\_2017.pdf](https://www.iepb.at/wp-content/uploads/2018/02/Psychischer_Arbeitnehmerschutz_in_der_EU_2017.pdf).