BRAIN. Broad Research in Artificial Intelligence and Neuroscience
e-ISSN: 2067-3957 | p-ISSN: 2068-0473
Covered in: Web of Science (ESCI); EBSCO; JERIH PLUS (hkdir.no); IndexCopernicus; Google Scholar; SHERPA/RoMEO; ArticleReach Direct; WorldCat; CrossRef; Peeref; Bridge of Knowledge (mostwiedzy.pl); abcdindex.com; Editage; Ingenta Connect Publication; OALib; scite.ai; Scholar9; Scientific and Technical Information Portal; FID Move; ADVANCED SCIENCES INDEX (European Science Evaluation Centre, neredataltics.org); ivySCI; exaly.com; Journal Selector Tool (letpub.com); Citefactor.org; fatcat!; ZDB catalogue; Catalogue SUDOC (abes.fr); OpenAlex; Wikidata; The ISSN Portal; Socolar; KVK-Volltitel (kit.edu)
2026, Volume 17, Issue 2, pages: 407-422
Submitted: February 24th, 2026 | *Accepted for publication:* May 21st, 2026

Wellbeing of Healthcare Personnel During the Covid-19 Pandemic: A Mediation Model of Behavioural Emotion Regulation Between Burnout and Addictive Behaviours

Andreea Ursu
Ph.D, Faculty of Educational Sciences, Ștefan cel Mare, University of Suceava, Romania,
https://orcid.org/0000-0002-6164-8914

Radu-George Bârliba
Ph.D, Faculty of Psychology and Educational Sciences, Alexandru Ioan Cuza, University of Iași, Romania;
Socola Institute of Psychiatry, 36 Bucium Street, 700282, Iași, România.
https://orcid.org/0009-0003-8417-8681

Radu Gavril
MD, Ph.D candidate, Department of Medicine III, Faculty of Medicine, Grigore T. Popa, University of Medicine and Pharmacy of Iași, 700115, Romania
Socola Institute of Psychiatry, 36 Bucium Street, 700282, Iași, România

Abstract: *This study aimed to examine whether behavioural emotion regulation mediated the relationship between burnout and addictive behaviours and whether life satisfaction moderated this association among Romanian healthcare personnel during the COVID-19 pandemic. A total of 137 healthcare professionals (84% women, Mage = 41.09, SD = 11.22, Mwork experience = 13.76, SD = 11.09) filled out a set of online scales. The results indicated positive associations between burnout and maladaptive behavioural emotion regulation strategies (withdrawal and ignoring), as well as a negative association between burnout and the adaptive strategy of active approach. Positive associations between burnout and compulsive eating, between withdrawal and compulsive eating were also found. In contrast, active approach was negatively associated with alcohol and drug use. Mediation analysis suggested that the association between burnout and compulsive eating was indirectly linked to withdrawal (b = .06, CI [.0055, .1221]). However, moderated mediation analyses showed that life satisfaction did not significantly moderate the relationship between burnout and compulsive eating among healthcare personnel (R^2=.004, p =.41).*

Keywords: *burnout; behavioural emotion regulation; addictive behaviours; compulsive eating; COVID-19 pandemic; healthcare personnel; Romania.*

How to cite: Ursu, A., Bârliba, R.-G., & Gavril, R. (2026). Wellbeing of healthcare personnel during the COVID-19 pandemic: A mediation model of behavioural emotion regulation between burnout and addictive behaviours. *BRAIN. Broad Research in Artificial Intelligence and Neuroscience, 17*(2), 407-422. https://doi.org/10.70594/brain/17.2/25

Correspondence concerning this article should be addressed to Radu Bârliba, Faculty Psychology and Educational Sciences, Iași, Romania. Contact: radu.barliba@uaic.ro

1. Introduction

Beginning on February 26th 2020, when the first case of Coronavirus was confirmed in Romania, and reaching its peak in April 2020 (Dascălu, 2020), the COVID-19 pandemic had a profound impact on people's lives, particularly on healthcare personnel. It generated a complex set of stressors, including increased mental health problems such as depression, anxiety, stress, insomnia and addictive behaviours (Javakhishvili et al., 2020; Vizheh et al., 2020). Although Romania initially avoided the most severe consequences of the first wave of COVID-19, by the end of 2020, the mortality rate had increased dramatically, accompanied by a 1.4 years decline in life expectancy, reaching 74.2 years (Byrne et al., 2023). According to the same study, this trend was partly driven by the relatively low vaccination rate of 27%, compared to the European average of 54% by 2021.

Within the Romanian healthcare system, medical staff faced numerous challenges during the pandemic, including shortages of medical equipment, a lack of clear protocols, insufficient protective equipment and high bed occupancy rates. These difficulties were further compounded by a shortage of trained intensive care personnel and prolonged working hours under significant time pressure, which heightened anxiety related to the constant risk of infection (Vizheh et al., 2020). Given the substantial psychological impact of the pandemic, identifying both risk and protective factors for the mental health of healthcare personnel became critical. Furthermore, it is essential to identify individuals who may be at increased risk of developing affective disorders or engaging in addictive behaviours. Thus, this study aimed to examine whether behavioural emotion regulation mediated the relationship between burnout and addictive behaviours and whether life satisfaction moderated this association among healthcare personnel during the COVID-19 pandemic.

Burnout and addictive behaviours among healthcare personnel

Burnout is conceptualised as a negative outcome of ineffective stress management. According to Maslach and Jackson (1981), burnout comprises three dimensions: *emotional exhaustion,* defined as the depletion of physical and emotional resources; *depersonalisation*, characterised by the development of cynical attitudes towards others, and *a diminished sense of personal accomplishment*. Previous studies have reported notable prevalence rates among doctors and nurses, with emotional exhaustion reaching 31%, depersonalisation 18% and reduced personal accomplishment 46% (Vasconcelos et al., 2018; Wright et al., 2022). Additionally, burnout has been associated with increased resignation, decreased patient satisfaction and higher rates of self-perceived medical errors among healthcare personnel (McHugh et al., 2011; Shanafelt et al., 2010; Vahey et al., 2004).

Burnout became more pronounced during the COVID-19 pandemic, which intensified these dimensions and introduced additional stressors such as increased workload, constant risk of infection, and insufficient medical resources and staffing (da Silva & Barbosa, 2021). Notably, workload has been identified as a key factor influencing both the frequency and intensity of burnout, with consequences not only for healthcare workers' wellbeing but also for the quality of care and the incidence of medical errors (Misiak et al., 2020). A recent meta-analysis reported an overall burnout prevalence of approximately 50% among healthcare personnel during the pandemic, with estimates ranging from 33% to 79%, depending on working conditions, geographical context and professional experience (Quesada-Puga et al., 2024). These findings underscore the importance of burnout as a critical factor affecting the lives of healthcare professionals, and further research is needed to better understand its causes and consequences.

Pandemic-related psychological stressors, such as stress, anxiety, fear of infection and concerns about transmitting the virus to close others, alongside work-related challenges such as a lack of medical equipment, unclear protocols and lack of protective equipment may contribute to increased engagement in addictive behaviours among healthcare personnel. Among the most prevalent behaviours during the COVID-19 pandemic are alcohol and drug use, as well as compulsive eating (Zvolensky et al., 2020). These behaviours have been conceptualised both as

coping mechanisms and as outcomes of maladaptive coping strategies (Madoz-Gúrpide et al., 2023; Reilly et al., 2021; Shechter et al., 2020).

Previous research suggests that healthcare personnel report relatively high rates of alcohol consumption (Hughes et al., 1992; Mikalauskas et al., 2018). For instance, 44% of physicians reported binge drinking (i.e., consuming six or more drinks on a single occasion), and 5% met the criteria for alcohol dependence (Medisauskaite & Kamau, 2019). Moreover, burnout has been positively associated with problematic alcohol use among both medical students (Jackson et al., 2016) and physicians (Mikalauskas et al., 2018). Physicians identified as problem drinkers have been found to be three times more likely to experience burnout (Mikalauskas et al., 2018).

Prescription drug misuse represents another significant concern, as physicians are up to five times more likely to use prescription medications compared to the general population, largely due to increased access and medical knowledge (Hughes et al., 1992). For instance, 24% of physicians in the United States reported using benzodiazepines, while 40% reported using minor opiates (Hughes et al., 1992). More recent data indicate that 44% of physicians reported using some form of medication, predominantly non-illicit substances, including prescription opioids (3%), benzodiazepines (2%) and sleep medication (5%) (Medisauskaite & Kamau, 2019). Furthermore, approximately 10% to 14% of physicians may develop substance use disorders at some point in their careers, with anaesthetists being 2.7 times more at risk compared to other specialties (Booth et al., 2002).

In addition to substance use, the COVID-19 pandemic has been associated with changes in eating behaviours among healthcare professionals. Recent studies indicate that 35% of physicians engage in excessive eating in the absence of physical hunger and 31% report eating until feeling uncomfortably full (Medisauskaite & Kamau, 2019). Additionally, 29% reported experiencing negative emotions such as shame, disgust or guilt following overeating, and 8% exhibited symptoms consistent with binge-eating disorder.

Research conducted in the general population has also demonstrated associations between burnout and adverse physical health outcomes, including increased body weight and chronic conditions such as type 2 diabetes (Honkonen et al., 2006; Melamed et al., 2006). Moreover, individuals experiencing burnout tend to report higher levels of emotional and uncontrolled eating (Nevanperä et al., 2012).

Similarly, studies focusing on healthcare personnel have shown that burnout is positively associated with sedative misuse, alcohol abuse and increased food intake among anaesthetists and intensive care physicians (Mikalauskas et al., 2018; Nevanperä et al., 2012). Based on this body of evidence, it is expected that burnout will be positively associated with addictive behaviours, including alcohol and drug use, as well as compulsive eating.

1.1. The Mediating Role of Emotion Regulation

Emotion regulation refers to an individual's efforts to change their affective responses in order to meet situational demands, either by decreasing negative affect (*down-regulation*) or maintaining and enhancing positive affect (*up-regulation*) (Gross, 2002). These processes can involve both cognitive and behavioural strategies. For instance, previous research indicates that individuals who use adaptive cognitive emotion regulation strategies – such as positive reappraisal, positive refocusing, putting events into perspective, planning, and acceptance - are better able to tolerate, deal with, and cope with negative life events even during challenging times such as the COVID-19 pandemic. In contrast, maladaptive cognitive strategies – such as rumination, catastrophising, self-blame, and other-blame have been associated with increased vulnerability to affective disorders (Carvajal et al., 2021; Dubey et al., 2020; Garnefski & Kraaij, 2006; Jurado et al., 2021; Oftadehal et al., 2012; Ursu & Măirean, 2022). Additionally, cognitive reappraisal has been found to be negatively associated with all three dimensions of burnout (emotional exhaustion, depersonalisation, lack of personal achievement), whereas expressive suppression has been

positively associated with two out of three burnout dimensions (emotional exhaustion and depersonalisation) among nurses during the COVID-19 pandemic (Xu et al., 2021).

In terms of behavioural emotion regulation, adaptive strategies such as active approach and seeking social support have been negatively associated with depressive symptoms, anxiety, negative self-concept, somatisation, hostility, and stress (Abdollahpour Ranjbar et al., 2021; Kraaij & Garnefski, 2019; Tuna, 2021; Zhao et al., 2020) and positively associated with psychological wellbeing (Kato, 2015). In contrast, maladaptive behavioural strategies, such as withdrawal and ignoring, have been positively associated with depression, anxiety, stress, negative self-concept, somatisation and hostility (Abdollahpour Ranjbar et al., 2021; Kraaij & Garnefski, 2019; Tuna, 2021; Zhao et al., 2020). Evidence from the coping literature further supports these findings, indicating that emotional exhaustion and depersonalisation are positively associated with dysfunctional coping strategies (Bamonti et al., 2019). In other words, nurses with high levels of emotional exhaustion and depersonalisation (dimensions of burnout) use more strategies such as behavioural disengagement, denial, self-distraction, self-blaming, substance use, and venting.

Concerning the relationship between emotion regulation and addictive behaviours, previous research has shown that difficulties in emotion regulation are associated with increased alcohol consumption both in quantity and frequency (Fox et al., 2008; Buckner et al., 2021), as well as with the severity of alcohol-related disorders (Cavicchioli et al., 2019). Individuals who experience greater difficulties in emotion regulation or rely more heavily on expressive suppression, a maladaptive strategy, are also more likely to report increased alcohol and drug consumption (Stellern et al., 2023). Furthermore, a meta-analysis indicated that among various emotion regulation difficulties – such as emotional avoidance, non-acceptance, suppression, rumination, problem-solving deficits, lack of cognitive reappraisal and lack of emotional awareness- rumination and difficulties in accepting emotions were most strongly associated with eating disorders symptoms across diagnoses (Leppanen et al., 2022).

Taken together, these findings suggest that emotion regulation may play both a protective and risk-enhancing role for healthcare personnel when facing stressful and uncomfortable conditions, such as the COVID-19 pandemic. Given that pandemic-related work conditions may contribute to burnout and increase the risk of affective disorders and addictive behaviours, it is expected that healthcare personnel who use adaptive emotion regulation strategies will report lower levels of burnout and fewer addictive behaviours. In contrast, those who rely on maladaptive strategies are expected to experience higher levels of burnout and greater vulnerability to addictive behaviours.

1.2. The Moderating Role of Life Satisfaction

Life satisfaction is defined as a cognitive evaluation of one's overall life, reflecting the extent to which individuals perceive their life as meeting their expectations and goals (Diener et al., 1985). Multiple factors may influence life satisfaction, including personality traits, workload, working hours, physical health, and social support from colleagues. Muntean et al. (2022) reported that Romanian physicians experienced increased levels of life satisfaction between the third and fourth waves of the COVID-19 pandemic. A recent study conducted by Łaskawiec-Żuławińska et al. (2024) examined the relationship between burnout and life satisfaction among healthcare workers (physicians, nurses and paramedics) during the COVID-19 pandemic. The findings indicated that higher levels of emotional exhaustion were associated with lower levels of life satisfaction. Similarly, higher levels of depersonalisation were linked to reduced life satisfaction, suggesting that feelings of dehumanisation and diminished professional fulfilment negatively impact overall well-being.

Based on these findings, life satisfaction may function as a protective factor under conditions of high stress, such as during a pandemic. Specifically, it may help identify healthcare personnel who are at high risk of engaging in addictive behaviours.

2. The Current Study

This study aimed to examine the relationship between burnout and addictive behaviours, focusing on the mediating role of behavioural emotion regulation among healthcare personnel during the COVID-19 pandemic in Romania. In order to test this mediation model, the following hypotheses were formulated: (a) burnout will be positively associated with maladaptive behavioural emotion regulation strategies (withdrawal and ignoring) and with addictive behaviours (alcohol and drug use and compulsive eating); (b) burnout will be negatively associated with adaptive behavioural emotion regulation strategies (seeking distraction, active approach and seeking social support); (c) maladaptive behavioural emotion regulation strategies (withdrawal and ignoring) will be positively associated with addictive behaviours; (d) adaptive behavioural emotion regulation strategies (seeking distraction, active approach and seeking social support) will be negatively associated with addictive behaviours (alcohol and drug use and compulsive eating); (e) behavioural emotion regulation strategies will mediate the relationship between burnout and addictive behaviours; and (f) life satisfaction will moderate the relationship between burnout and addictive behaviours.

The conceptual model is presented in Figure 1.

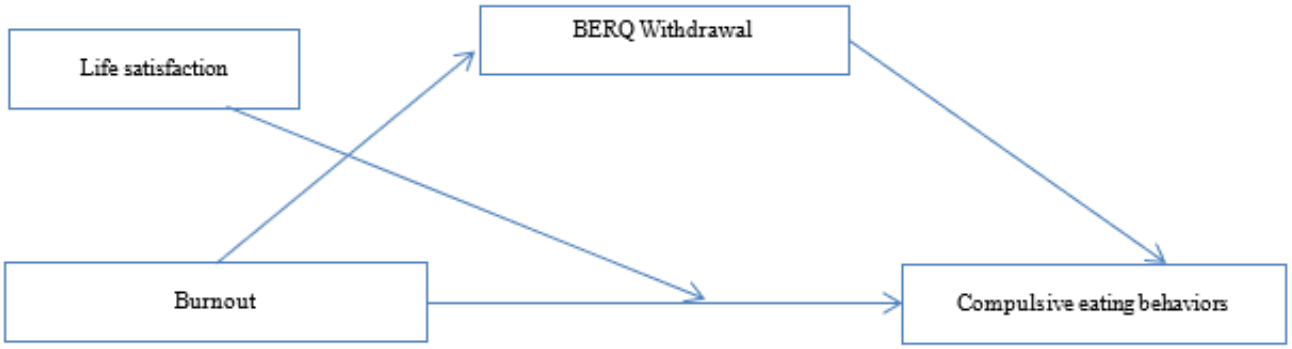

Figure 1. Moderated mediation model indicating the relationships between variables

2.1. Participants

The study sample consisted of 137 healthcare personnel (84% women) from eleven cities across various regions of Romania, aged between 22 and 70 years (M = 41.09, SD = 11.22) with an average working experience of 13.76 years (SD = 11.09), ranging from no prior experience (e.g., first-year medical students) to 42 years. In terms of education, 20% of participants had completed high school, 46% held a bachelor's degree, 25% held a master's degree, and 9% a Ph.D. Regarding occupational roles, 32% were physicians, 13% were clinical psychologists or social workers, 35% were nurses, 5% were cleaning personnel and drivers, and 7% were administrative personnel, while the remaining participants held other roles. All participants were employed in medical units that directly treated patients with COVID-19.

2.2. Procedure

The study protocol was approved by the Ethics Committee (No. 52/ 14.02.2022) of the affiliated university and was conducted in accordance with the ethical standards outlined in the 1964 Declaration of Helsinki and its subsequent amendments or comparable ethical standards.

This study is part of a larger research project aimed at identifying risk and protective factors associated with the wellbeing of healthcare personnel during the COVID-19 pandemic in Romania.

Participants were recruited through social media groups dedicated to healthcare personnel, using a snowball sampling method. Before filling out the sociodemographic questions and scales,

participants provided informed consent and were assured of the anonymity and confidentiality of their responses. Participation was voluntary, and no incentives were offered.

The questionnaire battery required approximately 10 minutes to complete and data were collected between March and August 2022.

2.3. Measures

2.3.1. Burnout

Burnout was assessed using a Romanian translated version of *Maslach Burnout Inventory* (Maslach et al., 1996). This instrument consists of 25 items across three dimensions: emotional exhaustion (9 items), depersonalisation (6 items) and professional accomplishment (10 items). For the purposes of this study, only the two negative dimensions - emotional exhaustion and depersonalisation – were included in the analyses. Items were rated on a 5-point Likert scale, ranging from 1(very rarely) to 5 (very frequently). An example item is "I feel tired when I get up in the morning and have to face another day on the job". In this study, the Cronbach's alpha reliability coefficient was .89.

2.3.2. Behavioural Emotion Regulation

Behavioural emotion regulation was measured using the Romanian validated version of *The Behavioural Emotion Regulation Questionnaire* (Kraaij & Garnefski 2019; Ursu & Măirean, 2022). This scale consists of 19 items, grouped into five subscales: three adaptive (seeking distraction, active approach and seeking social support) and two maladaptive (withdrawal and ignoring). Each subscale includes four items, except for ignoring, which consists of three items. Responses are rated on a 5-point Likert scale, ranging from 1(almost never) to 5 (almost always). Example items include "I engage in other, unrelated activities"," I avoid other people"," I get to work on it"," I ask someone for advice"," I move on and pretend that nothing happened". In this study, the Cronbach's alpha reliability coefficient ranged from .81 (active approach) to .87 (seeking social support), with .82 (seeking distraction), .85 (withdrawal) and .82 (ignoring).

2.3.3. Addictive Behaviours

Addictive behaviours were assessed using a Romanian translation of *The Psychiatric Diagnostic Screening Questionnaire* (Zimmerman & Mattia, 2001). For the purposes of this study, only the subscales assessing drug use, alcohol use and compulsive eating were included. The drug and alcohol subscales each consist of 6 items, while the compulsive eating subscale includes 10 items. Items were answered in a dichotomous format (yes = 1, no = 0). Example items include "Have you ever considered that you are taking too many drugs?"," Have you ever thought that you have a drinking problem?"," Have you ever felt ashamed of yourself because you ate too much?". In this study, the Cronbach's alpha reliability coefficients were .82 for drug use, .90 for alcohol use and .92 for compulsive eating.

2.3.4. Life satisfaction

Life satisfaction was measured using a Romanian translation of *The Satisfaction with Life Scale* (Diener et al., 1985). This scale consists of 5 items rated on a 7-point Likert scale ranging from 1 (strongly disagree) to 7 (strongly agree). An example item is "I am satisfied with my life". In this study, the Cronbach's alpha coefficient of SWLS was .86.

2.4. Results

2.4.1. Preliminary Results

Table 1 presents the means, standard deviations and bivariate correlations among the study variables.

Table 1. Descriptive statistics and correlations between study variables

	M	***SD***	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	*
1.Burnout	2.44	.68										*p*<
BERQ												
2. Seeking distraction	3.44	.83	-.12									
3. Withdrawal	2.38	1.00	.62**	.05								
4. Actively approaching	3.98	.78	-.42**	.43**	-.34**							
5. Seeking social support	3.37	1.04	-.02	.05	-.17*	.33**						
6. Ignoring	2.19	.95	.21*	.28**	.29**	-.21*	-.22**					
7. Life satisfaction	4.86	1.23	-.53**	.31**	-.37**	.49**	.21*	-.02				
PDSQ												
8. Drugs	.07	.18	.07	-.05	.12	-.24**	.07	.10	-.25**			
9. Compulsive eating	.10	.24	.21*	.03	.26**	-.10	.01	.03	-.30**	.41**		
10. Alcohol	.23	.32	-.01	-.09	.01	-.28**	-.10	-.02	-.13	.36**	.25**	

.05 ***p*< .001

2.4.2. Main Analyses

The results indicated positive associations between burnout and maladaptive behavioural emotion regulation strategies (withdrawal and ignoring), as well as between burnout and compulsive eating, partially supporting Hypothesis 1. No significant associations were found between burnout and the other two addictive behaviours (alcohol and drug use). A negative association was found between burnout and the adaptive strategy of active approach, partially supporting Hypothesis 2. No significant associations were found between burnout and the other adaptive strategies (seeking distraction and seeking social support). Regarding Hypothesis 3, a positive association was found only between withdrawal and compulsive eating. No significant associations were identified between withdrawal and alcohol and drug use, nor between ignoring and any of the addictive behaviours. Finally, no significant associations were found between seeking distraction or seeking social support and any addictive behaviors. However, partial support was found for Hypothesis 4, as active approach was negatively associated with alcohol and drug use.

2.4.3. Testing the Mediation Model

Using model 4 in Process, we examined whether withdrawal mediated the relationship between burnout and compulsive eating among healthcare personnel. The overall model was significant, R^2=.38, F (1,135) = 85.55, *MSE*=.62, $p < .001$, suggesting that burnout and withdrawal explained 38% of the variance in compulsive eating.

The total effect of burnout on compulsive eating was significant ($b = .10$, $p = .01$).

2.4.4. Direct Effects

Burnout had a direct positive effect on withdrawal ($b = .92$, $p <.001$), but its direct effect on compulsive eating was not significant ($b = .04$, $p > .05$). In addition, withdrawal showed a marginally direct positive effect on compulsive eating behaviours ($b = .06$, $p = .05$).

2.4.5. Indirect Effects

We assumed that withdrawal would explain the effect of burnout on compulsive eating behaviours' variance. The results showed that withdrawal mediated the effects of burnout on compulsive eating behaviours' variance (*b*= .06; *CI*: .0055; .1221).

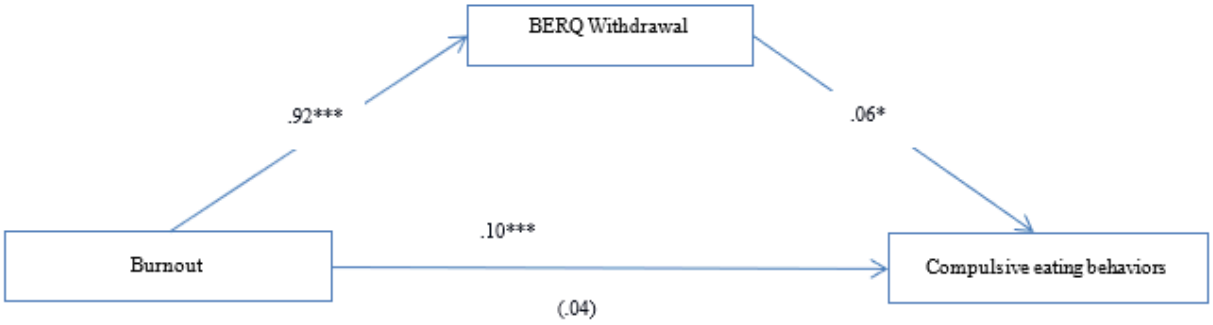

Figure 2. Mediation model indicating the relationships between variables

2.4.6. Testing the moderated mediation model

Using model 5 in Process, we examined whether withdrawal mediated the relationship between burnout and compulsive eating behaviours and whether life satisfaction moderated this relationship. The overall model was significant, R^2=.12, F (4,132) = 4.71, *MSE*=.09, p =.0014, suggesting that burnout, withdrawal and life satisfaction explained 12% of the variance in compulsive eating.

The total effect of burnout on compulsive eating behaviours was b = .10, p = .01.

Burnout was significantly associated with withdrawal (b = .92, p <.001), but was not significantly associated with compulsive eating (b = .01, p = .82). Withdrawal was marginally directly associated with compulsive eating behaviours (b = .06, p = .06).

In terms of indirect effects, the results revealed that withdrawal mediated the effects of burnout on compulsive eating behaviours' variance (*b*= .05; *CI*: .0004; .1175).

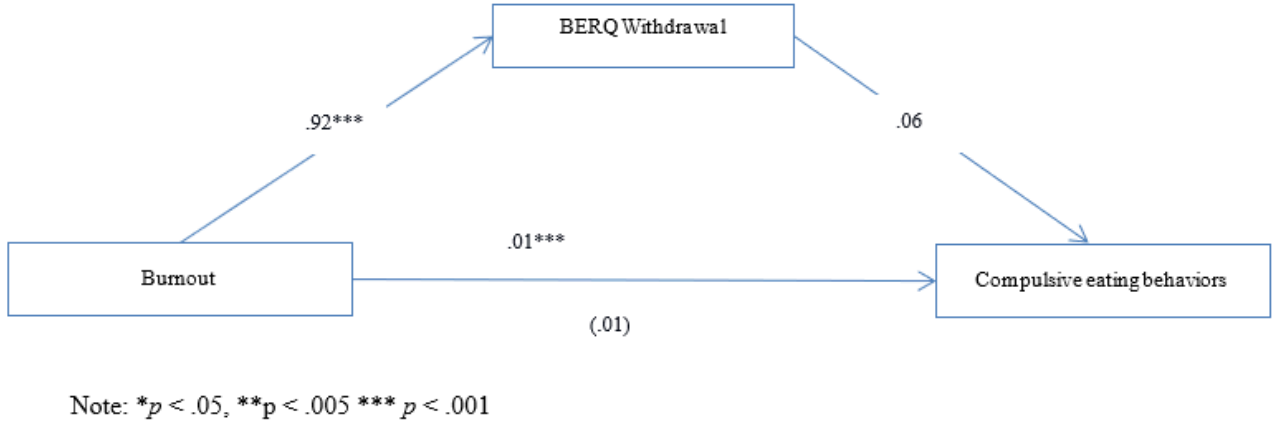

Figure 3. Mediation model indicating the relationships between variables

Life satisfaction was added to the model and was additionally a significant negative predictor of compulsive eating behaviours (b = .06, p = .007). However, the interaction between burnout and life satisfaction was non-significant (R^2=.004, F (1, 132) = .67, p =.41). For more details, see Table 2 and 3. To illustrate the interactions, simple slope analyses were conducted. Figure 4 presents the moderation patterns graphically. However, although the plotted simple slopes

suggest a trend in which burnout is more strongly associated with compulsive eating at higher levels of life satisfaction, the interaction effect was not statistically significant (p = .416, see Table 2), and none of the simple slopes differed significantly from zero. Therefore, there is no evidence supporting a moderating effect of life satisfaction.

Table 2. Moderation analysis: life satisfaction as a moderator for the association between burnout and compulsive eating among healthcare professionals

	b	SE	Z	*p*
Burnout	0.0418	0.0403	1.036	.300
Life satisfaction	-0.0723	0.0213	-3.387	<.001
Burnout x Life satisfaction	0.0231	0.0285	0.813	.416

Table 3. Simple Slope of burnout predicting compulsive eating at varying levels of life satisfaction among healthcare professionals

	b	SE	Z	*p*
Average	0.0418	0.0404	1.034	.301
Low (-1SD)	0.0134	0.0453	0.295	.768
High (+1SD)	0.0702	0.0605	1.160	.246

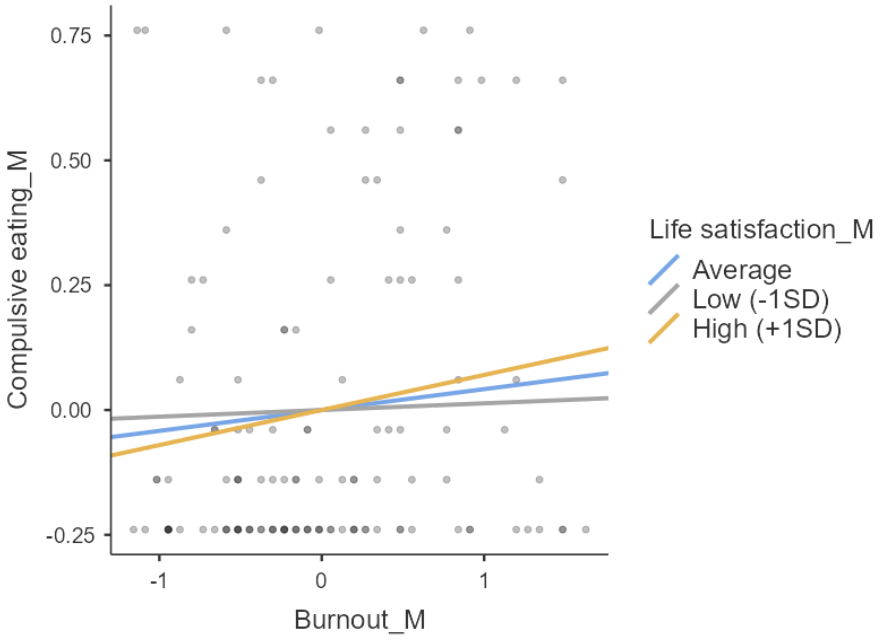

Figure 4. Life satisfaction as a moderator between burnout and compulsive eating behaviours

3. Discussion

This study aimed to examine the relationships between burnout and addictive behaviours by focusing on behavioural emotion regulation strategies as an underlying mechanism and life satisfaction as a potential moderator among healthcare personnel during the COVID-19 pandemic. More specifically, we examined whether adaptive (seeking social support, active approach, seeking distraction) and maladaptive (ignoring and withdrawal) behavioural emotion regulation strategies

mediated the relationship between burnout and addictive behaviours (alcohol and drug use and compulsive eating). Additionally, we tested the moderating role of life satisfaction in the relationship between burnout and addictive behaviours, including alcohol and drug use and compulsive eating behaviours.

Firstly, correlation analyses were performed. The results showed positive associations between burnout and both maladaptive behavioural emotion regulation strategies, withdrawal and ignoring, and negative association with only one adaptive behavioural emotion regulation strategy, namely active approach. Withdrawal was conceptualised as a broader disengagement from the interaction or situation, often involving physical or psychological distancing, whereas ignoring was framed as a more selective, stimulus-specific attentional strategy in which the individual remains present but deliberately withholds response. These findings are consistent with previous studies. For instance, positive correlations between withdrawal and ignoring and other affective disorders, such as depression, anxiety, stress, negative self-concept, somatisation and hostility, have been reported in recent research (Abdollahpour Ranjbar et al., 2021; Kraaij & Garnefski, 2019; Tuna, 2021; Zhao et al., 2020). Furthermore, studies examining other maladaptive strategies such as expressive suppression, have shown positive associations with two out of three burnout dimensions (emotional exhaustion and depersonalisation) among nurses during the COVID-19 pandemic (Xu et al., 2021). Similarly, dysfunctional coping strategies - such as behavioural disengagement, denial, self-distraction, self-blame, substance use and venting - considered as a maladaptive strategy, have been positively associated with emotional exhaustion and depersonalisation (dimensions of burnout) among nurses (Bamonti et al., 2019). Taken together, these findings suggest that healthcare personnel experiencing higher levels of burnout tend to rely more on maladaptive behavioural emotion regulation strategies, such as withdrawal and ignoring. Additionally, burnout was negatively associated with an active approach. Recent studies have also reported negative associations between active approach and affective disorders, including depressive symptoms, anxiety, negative self-concept, somatisation, hostility and stress (Abdollahpour Ranjbar et al., 2021; Kraaij & Garnefski, 2019; Tuna, 2021; Zhao et al., 2020). Moreover, cognitive reappraisal, another adaptive emotion regulation strategy, has been found to be negatively associated with all three burnout dimensions (emotional exhaustion, depersonalisation, lack of personal achievement).

Regarding the relationship between burnout and addictive behaviours, as expected, a positive association was found only between burnout and compulsive eating. Previous studies have shown that burnout is associated with weight gain and chronic physical conditions (Honkonen et al., 2006; Melamed et al., 2006), as well as with emotional and uncontrolled eating in the general population (Nevanperä et al., 2012). Eating-related disorders represent a significant concern among healthcare professionals. For instance, 8% of physicians report symptoms of binge-eating disorder, 35% engage in overeating in the absence of physical hunger, and 31% eat until they feel uncomfortably full (Medisauskaite & Kamau, 2019). Additionally, 29% report experiencing negative emotions such as shame, disgust or guilt after overeating (Medisauskaite & Kamau, 2019). Although research on eating behaviours among healthcare personnel during the COVID-19 pandemic is limited, existing evidence suggests that such behaviours are associated with other affective disorders, including anxiety and depression (Yao et al., 2022). One possible explanation relates to working conditions, such as night shifts, which may disrupt eating patterns. Previous research suggests that adjusting meal timing during night shifts may help reduce psychological distress, including symptoms of anxiety, depression and PTSD (Yao et al., 2022). These findings contribute to the existing literature on burnout and addictive behaviours among healthcare professionals during large-scale health crises such as the COVID-19 pandemic.

Concerning the association between behavioural emotion regulation strategies and addictive behaviours, the results showed a positive association between withdrawal and compulsive eating and negative associations between active approach and alcohol and drug use. The same pattern of results was suggested by previous systematic reviews and meta-analyses where other maladaptive emotion regulation, such as rumination and difficulties in accepting one's emotion regulation were

positively associated with trans-diagnostically eating disorders symptoms (Leppanen et al., 2022). One possible explanation for the lack of significant associations between other behavioural emotion regulation strategies and addictive behaviours is that previous systematic reviews and meta-analyses have primarily included samples from the general population rather than healthcare professionals. Moreover, these studies mainly focused on difficulties in emotion regulation, cognitive emotion regulation strategies or general coping strategies, rather than on behavioural emotion regulation specifically (Buckner et al., 2021; Cavicchioli et al., 2019; Fox et al., 2008; Leppanen et al., 2022; Stellern et al., 2023). Therefore, these findings do not necessarily contradict previous research; rather, they extend the knowledge about the complex correlations between emotion regulation and addictive behaviours among healthcare personnel.

Our principal objective was to test a moderated mediation model, with behavioural emotion regulation as a mediator in the relationship between burnout and addictive behaviours and life satisfaction as a moderator of this relationship. Based on the correlations analyses, we were able to test whether withdrawal mediated the relationship between burnout and compulsive eating and whether life satisfaction moderated this relationship. Firstly, we tested a simple mediation model. The results showed that withdrawal fully mediated the relationship between burnout and compulsive eating among healthcare personnel. More specifically, burnout had a direct positive effect on withdrawal. Healthcare professionals with higher levels of burnout tend to rely more on withdrawal, a maladaptive behavioural emotion regulation strategy, when dealing with personal and work-related challenges during the COVID-19 pandemic. This finding is consistent with previous research showing positive associations between withdrawal and affective disorders, such as depression, anxiety and stress (Abdollahpour Ranjbar et al., 2021; Kraaij & Garnefski, 2019; Tuna, 2021; Zhao et al., 2020). Additionally, previous studies have reported that emotional exhaustion and depersonalisation (dimensions of burnout) are positively associated with maladaptive coping strategies, including behavioural disengagement, denial, self-distraction, self-blame, substance use and venting among nurses (Bamonti et al., 2019). The direct effect of withdrawal on compulsive eating observed in this study is also supported by previous research. Healthcare personnel who rely on withdrawal as a coping strategy in response to pandemic-related stressors may be more likely to engage in overeating behaviours. Eating-related disorders are relatively common among healthcare professionals and represent one of the addictive behaviours most likely to emerge during periods of health crisis (Zvolensky et al., 2020). Although no direct effect of burnout on compulsive eating was found, a significant indirect effect through withdrawal was identified. Taken together, these findings suggest a mediating role of withdrawal in the relationship between burnout and compulsive eating. In other words, higher levels of burnout are associated with increased use of withdrawal, which in turn is linked to higher levels of compulsive eating among healthcare personnel.

Secondly, we tested the moderated mediation model. The results showed a similar pattern, with a direct positive effect of burnout on withdrawal, a barely significant effect of withdrawal on compulsive eating, and a non-significant direct effect of burnout on compulsive eating and a significant indirect effect of withdrawal for the link between burnout and compulsive eating. Life satisfaction did not significantly moderate the relationship between burnout and compulsive eating. The notable result from the moderated mediation model is that higher life satisfaction is associated with lower compulsive eating. This represents an important finding, given the limited literature on burnout, behavioural emotion regulation, and addictive behaviours among healthcare personnel during the COVID-19 pandemic. One possible explanation is that Romanian healthcare professionals may report relatively high levels of life satisfaction in the period between the third and the fourth COVID-19 pandemic waves (Muntean et al., 2022), a pattern also reflected in this sample. Overall, the findings suggest that during health care crises, characterised by high levels of stress, anxiety, fear of infection and concerns about transmitting the virus to close others, in addition to work related issues, insufficient medical equipment, a lack of clear protocols, insufficient protective equipment and high bed occupancy rates, healthcare personnel may be at risk of

worsening addictive behaviours, such as compulsive eating, particularly when experiencing high levels of burnout and relying on withdrawal, as an emotion regulation strategy.

The results of the present study have important clinical implications. Healthcare professionals are at increased risk of burnout, exhaustion, anxiety, depression and addictive disorders due to the demands of their daily work during the COVID-19 pandemic. In order to mitigate these unwanted effects on medical and administrative personnel, managers of healthcare institutions should promote and offer psychological support programs, better working conditions, better payment, and reduced working schedule for those who activate especially in nightshifts or emergency units. Addressing burnout for the healthcare personnel should be a key priority for public healthcare systems, considering that this professional group was the most exposed to burnout during pandemic and faced high levels of mental health disorders. Our results highlight the need for a better understanding of the mechanisms underlying functional emotion regulation strategies and coping mechanisms in order to reduce the psychological impact of future pandemics on healthcare personnel.

Our study and the associated methodology contribute to a better understanding of the psychological impact of COVID-19 among healthcare personnel. Despite its strengths, the present study is not without limitations. Firstly, we used a relatively small sample of healthcare professionals, including administrative personnel from several medical units in Romania. In addition, the sample was not homogeneous in terms of occupation, education level, work experience or gender, which requires caution when generalising the findings to other healthcare professionals. Future research should include larger group samples, as well as participants working in specific medical settings, such as emergency units or those regularly working night shifts. Additionally, future studies could further investigate the relationships between the study's variables using clinically informed frameworks and transdiagnostic models of stress-related psychopathology, while also examining whether maladaptive coping strategies and compulsive eating behaviours reflect mechanisms associated with emotional eating or binge-eating symptomatology in clinical and subclinical populations. Moreover, other factors that may influence life satisfaction were not included in this study, such as job satisfaction, occupational exhaustion, motivational persistence or general health status. The study relied on self-report scales and a cross-sectional design, thus as with any correlational research design, we acknowledge that correlation does not imply causation. Therefore, the present findings do not allow for conclusions regarding the temporal ordering or causal nature of the relationships among burnout, behavioural emotion regulation strategies, such as withdrawal, and compulsive eating behaviours. Finally, the results may not be generalisable to healthcare personnel outside Romania.

In conclusion, the findings of the present study indicate that withdrawal, as a maladaptive behavioural emotion regulation strategy, mediates the relationship between burnout and compulsive eating among healthcare personnel during the COVID-19 pandemic.

Ethics approval

The protocol of this study was approved by the Ethics Committee (52/ 14.02.2022) of the university where the study was conducted. The study was performed in accordance with the ethical standards as laid down in the 1964 Declaration of Helsinki and its later amendments or comparable ethical standards

Consent for publication

Participants signed informed consent regarding publishing their data

Data availability

The data used in this research can be obtained at: via email.

Competing interests and funding
Non funds, grants or other support was received.
The authors have no relevant financial or non-financial interests to disclose.

Authors' contributions
Conceptualization: A.U., R.-G.B.; Methodology: A.U., R.-G.B; Formal analysis and investigation: A.U.; Data collection: R.-G.B, R.G ;Writing - original draft preparation: A.U., R.-G.B; Writing - review and editing: A.U., R.-G.B, R.G.

Acknowledgments
Not applicable

References

Abdollahpour Ranjbar, H., Parhoon, H., Mohammadkhani, S., Munawar, K., Moradi, A., & Jobson, L. (2021). Investigating cognitive control and cognitive emotion regulation in Iranian depressed women with suicidal ideation or suicide attempts. *Suicide and Life-Threatening Behavior, 51*(3), 586–595. https://doi.org/10.1111/sltb.12735

Bamonti, P., Conti, E., Cavanagh, C., Gerolimatos, L., Gregg, J., Goulet, C., Pifer, M., & Edelstein, B. (2019). Coping, cognitive emotion regulation, and burnout in long-term care nursing staff: A preliminary study. *Journal of Applied Gerontology, 38*(1), 92–111. https://doi.org/10.1177/0733464817716970

Booth, J. V., Grossman, D., Moore, J., Lineberger, C., Reynolds, J. D., Reves, J. G., & Sheffield, D. (2002). Substance abuse among physicians: A survey of academic anesthesiology programs. *Anesthesia & Analgesia, 95*(4), 1024–1030. https://doi.org/10.1213/00000539-200210000-00043

Byrne, J. P., Humphries, N., McMurray, R., & Scotter, C. (2023). COVID-19 and healthcare worker mental well-being: Comparative case studies on interventions in six countries in the WHO European Region. *Health Policy, 135*, 104863. https://doi.org/10.1016/j.healthpol.2023.104863

Buckner, J. D., Lewis, E. M., Abarno, C. N., Morris, P. E., Glover, N. I., & Zvolensky, M. J. (2021). Difficulties with emotion regulation and drinking during the COVID-19 pandemic among undergraduates: The serial mediation of COVID-related distress and drinking to cope with the pandemic. *Cognitive Behaviour Therapy, 50*(4), 261–275. https://doi.org/10.1080/16506073.2020.1861084

Cavicchioli, M., Movalli, M., & Maffei, C. (2019). Difficulties with emotion regulation, mindfulness, and substance use disorder severity: The mediating role of self-regulation of attention and acceptance attitudes. *The American Journal of Drug and Alcohol Abuse, 45*(1), 97–107. https://doi.org/10.1080/00952990.2018.1511724

Carvajal, B. P., Molina-Martínez, M. Á., Fernández-Fernández, V., Paniagua-Granados, T., Lasa-Aristu, A., & Luque-Reca, O. (2021). Psychometric properties of the Cognitive Emotion Regulation Questionnaire (CERQ) in Spanish older adults. *Aging & Mental Health, 25*(3), 413–422. https://doi.org/10.1080/13607863.2020.1870207

Dascalu, S. (2020). The successes and failures of the initial COVID-19 pandemic response in Romania. *Frontiers in Public Health, 8*, 344. https://doi.org/10.3389/fpubh.2020.00344

da Silva, F. C. T., & Barbosa, C. P. (2021). The impact of the COVID-19 pandemic in an intensive care unit (ICU): Psychiatric symptoms in healthcare professionals. *Progress in Neuro-Psychopharmacology and Biological Psychiatry, 110*, 110299. https://doi.org/10.1016/j.pnpbp.2021.110299

Diener, E. D., Emmons, R. A., Larsen, R. J., & Griffin, S. (1985). The satisfaction with life scale. *Journal of Personality Assessment, 49*(1), 71–75. https://doi.org/10.1207/s15327752jpa4901_13

Dubey, N., Podder, P., & Pandey, D. (2020). Knowledge of COVID-19 and its influence on mindfulness, cognitive emotion regulation and psychological flexibility in the Indian community. *Frontiers in Psychology, 11*, 589365. https://doi.org/10.3389/fpsyg.2020.589365

Fox, H. C., Hong, K. A., & Sinha, R. (2008). Difficulties in emotion regulation and impulse control in recently abstinent alcoholics compared with social drinkers. *Addictive Behaviors, 33*(2), 388–394. https://doi.org/10.1016/j.addbeh.2007.10.002

Garnefski, N., & Kraaij, V. (2006). Relationships between cognitive emotion regulation strategies and depressive symptoms: A comparative study of five specific samples. *Personality and Individual Differences, 40*(8), 1659–1669. https://doi.org/10.1016/j.paid.2005.12.009

Gross, J. J. (2002). Emotion regulation: Affective, cognitive, and social consequences. *Psychophysiology, 39*(3), 281–291. https://doi.org/10.1017/S0048577201393198

Honkonen, T., Ahola, K., Pertovaara, M., Isometsä, E., Kalimo, R., Nykyri, E., Aromaa, A., & Lönnqvist, J. (2006). The association between burnout and physical illness in the general population—Results from the Finnish Health 2000 Study. *Journal of Psychosomatic Research, 61*(1), 59–66. https://doi.org/10.1016/j.jpsychores.2005.10.002

Hughes, P. H., Brandenburg, N., Baldwin, D. C., Storr, C. L., Williams, K. M., Anthony, J. C., & Sheehan, D. V. (1992). Prevalence of substance use among US physicians. *JAMA, 267*(17), 2333–2339. https://doi.org/10.1001/jama.1992.03480170059029

Jackson, E. R., Shanafelt, T. D., Hasan, O., Satele, D. V., & Dyrbye, L. N. (2016). Burnout and alcohol abuse/dependence among US medical students. *Academic Medicine, 91*(9), 1251–1256. https://doi.org/10.1097/ACM.0000000000001138

Javakhishvili, J. D., Ardino, V., Bragesjö, M., Kazlauskas, E., Olff, M., & Schäfer, I. (2020). Trauma-informed responses in addressing public mental health consequences of the COVID-19 pandemic: Position paper of the European Society for Traumatic Stress Studies (ESTSS). *European Journal of Psychotraumatology, 11*(1), 1780782. https://doi.org/10.1080/20008198.2020.1780782

Jurado, M. D. M. M., del Carmen Pérez-Fuentes, M., Fernández-Martínez, E., Martínez, Á. M., & Linares, J. J. G. (2021). Coping strategies in the Spanish population: The role in consequences of COVID-19 on mental health. *Frontiers in Psychiatry, 12*, 606621. https://doi.org/10.3389/fpsyt.2021.606621

Kato, T. (2015). Frequently used coping scales: A meta-analysis. *Stress and Health, 31*(4), 315–323. https://doi.org/10.1002/smi.2557

Kraaij, V., & Garnefski, N. (2019). The Behavioral Emotion Regulation Questionnaire: Development, psychometric properties and relationships with emotional problems and the Cognitive Emotion Regulation Questionnaire. *Personality and Individual Differences, 137*, 56–61. https://doi.org/10.1016/j.paid.2018.07.036

Łaskawiec-Żuławińska, D., Grajek, M., Krupa-Kotara, K., Szlacheta, P., Karacan, H., Roszak, M., Łabuz-Roszak, B., & Korzonek-Szlacheta, I. (2024). Burnout and life satisfaction among healthcare workers related to the COVID-19 pandemic (Silesia, Poland). *Behavioural Neurology*. https://doi.org/10.1155/2024/9945392

Leppanen, J., Brown, D., McLinden, H., Williams, S., & Tchanturia, K. (2022). The role of emotion regulation in eating disorders: A network meta-analysis approach. *Frontiers in Psychiatry, 13*, 793094. https://doi.org/10.3389/fpsyt.2022.793094

Madoz-Gúrpide, A., Leira-Sanmartín, M., Ibanez, Á., & Ochoa-Mangado, E. (2023). Self-reported increase in alcohol and drugs intake as a coping strategy in hospital workers during COVID-19 outbreak: A cross-sectional study. *Adicciones, 35*(2), 143–150. https://doi.org/10.20882/adicciones.1643

Maslach, C., & Jackson, S. E. (1981). The measurement of experienced burnout. *Journal of Organizational Behavior, 2*(2), 99–113. https://doi.org/10.1002/job.4030020205

Maslach, C., Jackson, S. E., & Leiter, M. P. (1996). *MBI: Maslach burnout inventory manual* (3rd ed.). CPP, Incorporated.

McHugh, M. D., Kutney-Lee, A., Cimiotti, J. P., Sloane, D. M., & Aiken, L. H. (2011). Nurses' widespread job dissatisfaction, burnout, and frustration with health benefits signal problems for patient care. *Health Affairs, 30*(2), 202–210. https://doi.org/10.1377/hlthaff.2010.0100

Medisauskaite, A., & Kamau, C. (2019). Does occupational distress raise the risk of alcohol use, binge-eating, ill health and sleep problems among medical doctors? A UK cross-sectional study. *BMJ Open, 9*(5), e027362. https://doi.org/10.1136/bmjopen-2018-027362

Melamed, S., Shirom, A., Toker, S., & Shapira, I. (2006). Burnout and risk of type 2 diabetes: A prospective study of apparently healthy employed persons. *Psychosomatic Medicine, 68*(6), 863–869. https://doi.org/10.1097/01.psy.0000242860.24009.f0

Mikalauskas, A., Benetis, R., Širvinskas, E., Andrejaitienė, J., Kinduris, Š., Macas, A., & Padaiga, Ž. (2018). Burnout among anesthetists and intensive care physicians. *Open Medicine, 13*(1), 105–112. https://doi.org/10.1515/med-2018-0017

Misiak, B., Sierzantowicz, R., Krajewska-Kułak, E., Lewko, K., Chlińska, J., & Lewko, J. (2020). Psychosocial work-related hazards and their relationship to the quality of life of nurses: A cross-sectional study. *International Journal of Environmental Research and Public Health, 17*(3), 755. https://doi.org/10.3390/ijerph17030755

Muntean, L. M., Nireștean, A., Popa, C. O., Strete, E. G., Ghiga, D. V., Sima-Comaniciu, A., & Lukacs, E. (2022). The relationship between emotional stability, psychological well-being and life satisfaction of Romanian medical doctors during COVID-19 period: A cross-sectional study. *International Journal of Environmental Research and Public Health, 19*(5), 2937. https://doi.org/10.3390/ijerph19052937

Nevanperä, N. J., Hopsu, L., Kuosma, E., Ukkola, O., Uitti, J., & Laitinen, J. H. (2012). Occupational burnout, eating behavior, and weight among working women. *The American Journal of Clinical Nutrition, 95*(4), 934–943. https://doi.org/10.3945/ajcn.111.014191

Oftadehal, M., Mahmoodi-Kahriz, B., & Torrabinami, M. (2012). Cognitive emotion regulation, depression and stress in Iranian students. *Neuroscience Research Letters, 3*(1), 44–47.

Quesada-Puga, C., Izquierdo-Espin, F. J., Membrive-Jiménez, M. J., Aguayo-Estremera, R., Cañadas-De La Fuente, G. A., Romero-Béjar, J. L., & Gómez-Urquiza, J. L. (2024). Job satisfaction and burnout syndrome among intensive-care unit nurses: A systematic review and meta-analysis. *Intensive and Critical Care Nursing, 82*, 103660. https://doi.org/10.1016/j.iccn.2024.103660

Shanafelt, T. D., Balch, C. M., Bechamps, G., Russell, T., Dyrbye, L., Satele, D., Collicott, P., Novotny, P. J., Sloan, J., & Freischlag, J. (2010). Burnout and medical errors among American surgeons. *Annals of Surgery, 251*(6), 995–1000. https://doi.org/10.1097/SLA.0b013e3181bfdab3

Shechter, A., Diaz, F., Moise, N., Anstey, D. E., Ye, S., Agarwal, S., Birk, J. L., Brodie, D., Cannone, D. E., Chang, B., Claassen, J., Cornelius, T., Derby, L., Dong, M., Givens, R. C., Hochman, B., Homma, S., Kronish, I. M., Lee, S. A. J., … Abdalla, M. (2020). Psychological distress, coping behaviors, and preferences for support among New York healthcare workers during the COVID-19 pandemic. *General Hospital Psychiatry, 66*, 1–8. https://doi.org/10.1016/j.genhosppsych.2020.06.007

Stellern, J., Xiao, K. B., Grennell, E., Sanches, M., Gowin, J. L., & Sloan, M. E. (2023). Emotion regulation in substance use disorders: A systematic review and meta-analysis. *Addiction, 118*(1), 30–47. https://doi.org/10.1111/add.16001

Reilly, S. E., Soulliard, Z. A., McCuddy, W. T., & Mahoney, J. J., III. (2021). Frequency and perceived effectiveness of mental health providers' coping strategies during COVID-19. *Current Psychology, 40*(11), 5753–5762. https://doi.org/10.1007/s12144-021-01683-x

Tuna, E. (2021). Psychometric properties of the Turkish version of the Behavioral Emotion Regulation Questionnaire (BERQ). *The Journal of General Psychology, 148*(4), 414–430. https://doi.org/10.1080/00221309.2020.1752137

Ursu, A., & Măirean, C. (2022). Cognitive emotion regulation strategies as mediators between resilience and stress during COVID-19 pandemic. *International Journal of Environmental Research and Public Health, 19*(19), 12631. https://doi.org/10.3390/ijerph191912631

Vahey, D. C., Aiken, L. H., Sloane, D. M., Clarke, S. P., & Vargas, D. (2004). Nurse burnout and patient satisfaction. *Medical Care, 42*(2 Suppl.), II-57–II-66. https://doi.org/10.1097/01.mlr.0000109126.50398.5a

Vasconcelos, E. M., Martino, M. M. F., & França, S. P. S. (2018). Burnout and depressive symptoms in intensive care nurses: Relationship analysis. *Revista Brasileira de Enfermagem, 71*(1), 135–141. https://doi.org/10.1590/0034-7167-2016-0019

Vizheh, M., Qorbani, M., Arzaghi, S. M., Muhidin, S., Javanmard, Z., & Esmaeili, M. (2020). The mental health of healthcare workers in the COVID-19 pandemic: A systematic review. *Journal of Diabetes & Metabolic Disorders, 19*, 1967–1978. https://doi.org/10.1007/s40200-020-00643-9

Wright, T., Mughal, F., Babatunde, O. O., Dikomitis, L., Mallen, C. D., & Helliwell, T. (2022). Burnout among primary health-care professionals in low- and middle-income countries: Systematic review and meta-analysis. *Bulletin of the World Health Organization, 100*(6), 385–401. https://doi.org/10.2471/BLT.22.288300

Xu, X., Chen, L., Yuan, Y., Xu, M., Tian, X., Lu, F., & Wang, Z. (2021). Perceived stress and life satisfaction among Chinese clinical nursing teachers: A moderated mediation model of burnout and emotion regulation. *Frontiers in Psychiatry, 12*, 548339. https://doi.org/10.3389/fpsyt.2021.548339

Yao, Z., Xie, X., Bai, R., Li, L., Zhang, X., Li, S., Ma, Y., Hui, Z., & Chen, J. (2022). The impact of eating behaviors during COVID-19 in health-care workers: A conditional process analysis of eating, affective disorders, and PTSD. *Heliyon, 8*(10), e10892. https://doi.org/10.1016/j.heliyon.2022.e10892

Zhao, Y., Li, P., Wang, X., Kong, L., Wu, Y., & Liu, X. (2020). The Chinese version of the Behavioral Emotion Regulation Questionnaire: Psychometric properties among university students. *Neuropsychiatric Disease and Treatment, 16*, 1889–1897. https://doi.org/10.2147/NDT.S258806

Zimmerman, M., & Mattia, J. I. (2001). The Psychiatric Diagnostic Screening Questionnaire: Development, reliability, and validity. *Comprehensive Psychiatry, 42*(3), 175–189. https://doi.org/10.1053/comp.2001.23126

Zvolensky, M. J., Garey, L., Rogers, A. H., Schmidt, N. B., Vujanovic, A. A., Storch, E. A., Buckner, J. D., Paulus, D. J., Alfano, C., Smits, J. A. J., & O'Cleirigh, C. (2020). Psychological, addictive, and health behavior implications of the COVID-19 pandemic. *Behaviour Research and Therapy, 134*, 103715. https://doi.org/10.1016/j.brat.2020.103715