Doctoral (PhD) dissertation

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Occupational Stress, Mental Health Outcomes, and Protective Factors Among Healthcare Workers

2026

EÖTVÖS LORÁND UNIVERSITY FACULTY OF EDUCATION AND PSYCHOLOGY

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DOI-t: 10.15476/ELTE.2026.115.

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Budapest, 2026

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1. Acknowledgements

Completing this dissertation would not have been possible without the support, guidance, patience, and occasional persistence of many people around me.

First and foremost, I would like to express my deepest gratitude to my supervisors, Professor Zsolt Demetrovics and Professor Adrien Rigó. I owe an enormous intellectual debt to both of them.

Zsolt Demetrovics's extraordinary work ethic, unwavering determination, and relentless goal orientation never left room for doubt that the doctoral process could —and should— be completed. Any tendency toward hesitation or postponement was met with remarkable efficiency and clarity. His confidence in the process was, at times, stronger than my own.

Adrien Rigó's exceptional precision, tireless work ethic, and patient guidance were equally indispensable. Her ability to teach with patience, while correcting what now seem to me obvious beginner's mistakes, shaped both this dissertation and my scientific thinking in fundamental ways. I learned a tremendous amount from both of them. At times, meeting the expectations of two such different but equally demanding mentors felt almost impossible; in retrospect, however, their complementary strengths formed an exceptional combination for doctoral supervision.

I would also like to express my sincere gratitude to Professor Zsuzsanna Füzesi, who provided invaluable support throughout my university years and continued to help me during this research process. She played a decisive role in shaping my social scientific and social psychological perspective, which fundamentally influenced the way I approach healthcare, mental health, and research questions more broadly.

I am equally grateful to Dr. Dávid Simon, without whom my knowledge of statistics and research methodology would hardly exist in its current form. Similar to my supervisors, I learned an enormous amount from him, and I sincerely hope that our shared work and future research collaborations will continue in the years ahead.

I also owe special thanks to my mother, who was once Zsolt Demetrovics's secondary school teacher. Without her, I would likely never have met one of my future supervisors

— a rather beautiful example of transgenerational continuity in education and mentorship. From her, I inherited persistence, commitment, and respect for hard work.

My deepest gratitude goes to my wife, Anna, for her patience during the many difficult moments, for enduring the frustrations that accompanied endless rewrites, and for the editorial confidence, practical advice, and emotional steadiness she brought throughout this process. Her presence made the burden lighter in more ways than she probably realizes.

I would also like to acknowledge András Radnóti, with whom I once shared a memorable and somewhat chaotic period of doctoral writing in the Balaton Highlands —an experience already immortalized, to my great honour, in the acknowledgements of his own dissertation. It feels only appropriate to return the gesture here.

Finally, I wish to thank my family and friends for the support, energy, and encouragement that carried me through this journey. I sincerely hope to carry forward the momentum, curiosity, and resilience that I received from them into the next chapters of my professional and academic life.

2. Preface

As a medical student, I have personally experienced the significant mental strain that comes with medical education. Despite the academic rigor and professional requirements, there is insufficient preparation for the psychological challenges inherent in medical training. The medical education system often fosters a highly stressful and sometimes even traumatic learning environment where students are socialized into a professional culture that does not always prioritize empathy and emotional well-being. Instead, the implicit curriculum often encourages a kind of "professional alexithymia", in which the suppression of emotions is modeled as a coping mechanism rather than the development of effective coping strategies (Shapiro, 2011; Newton et al., 2008).

This personal experience shaped my research interests, which led me to focus on medical career socialization, the mental health of health professionals, and the dynamics of the doctor-patient relationship. Early in my medical career, I recognized that many doctors are neither mentally nor professionally equipped to fully grasp the deeper psychological aspects of the doctor-patient relationship, nor are they adequately protected from the emotional burdens of clinical work. This lack of preparation negatively affects clinicians, patient compliance, and treatment outcomes (Hojat et al., 2002; Shanafelt et al., 2002).

Participating in Balint groups and psychotherapy training has broadened my understanding of these dynamics throughout my professional journey. The Balint leadership training program and psychotherapy training gave me essential insights into the importance of reflective practice and the doctor-patient relationship as fundamental aspects of medical professionalism. By emphasizing the emotional dimension of clinical work, these programs provided tools for more sustainable coping mechanisms, promoting professional satisfaction and improved patient care.

At a time when my research on the doctor-patient relationship and medical socialization was already underway, the COVID-19 pandemic emerged, fundamentally changing the landscape of health care. The crisis had a disproportionate impact on an already vulnerable and mentally exhausted workforce, revealing severe gaps in the emotional preparedness of health professionals (Pappa et al., 2020; Dyrbye et al., 2005). In response, my study expanded to examine how health workers weathered this period of extreme stress, their coping mechanisms, and what potential protective factors contributed to their emotional resilience.

This dissertation aims to address the psychological challenges of healthcare professionals and medical students by examining both the impact of the COVID-19 pandemic and the long-term consequences of medical career socialization on physicians' well-being and physician–patient interactions. While medical education shapes coping attitudes early in training, the pandemic created an unprecedented context of extreme stress that exposed healthcare professionals to emotional exhaustion and secondary traumatization. At the same time, the early years of medical training play a crucial role in shaping professional identity and developing coping patterns, during which empathy, role models, and protective psychological factors can influence later vulnerability to burnout.

By presenting research findings, I aim to:

1. Draw attention to the physician training and clinical practice's widespread but often overlooked psychological burdens.

2. Demonstrate the relationship among physicians' mental health, burnout, and patient care outcomes, and reinforce the importance of empathy and emotional intelligence in medical education.

3. Identify protective factors that mitigate the adverse effects of stress, burnout, and emotional exhaustion, and provide practical strategies for building resilience and preventing these issues.

4. Show how the COVID-19 pandemic affected healthcare workers' mental health in its initial and later phases, highlighting both risks and protective psychological factors.

5. Demonstrate the role of medical training on the mental health of medical students and subsequent doctor-patient relationships, and examine attitudes and coping strategies learned during medical training that will significantly impact the mental health of future doctors and their interactions with patients.

By addressing these issues, I aim to contribute to a more sustainable and humane approach to medical education and the healthcare work environment, ultimately benefiting both healthcare professionals and the patients they serve.

2.1. Summary of the performed projects

The dissertation comprises three empirical studies that explore the mental health of healthcare professionals and medical students across various yet interconnected contexts. The first study was an extensive cross-sectional survey conducted during the initial phase of the COVID-19 pandemic to assess risk and protective factors for healthcare workers' mental health. The second study adopted a longitudinal design to examine the dynamics of emotional exhaustion, secondary traumatization, and protective psychological factors among healthcare workers during a later phase of the pandemic. The third study focused on medical students, investigating the role of empathy, stress, cynicism, and patient-centered role models in the early stages of medical career socialization. Together, these studies provide complementary perspectives on the psychological challenges and protective factors relevant to both practicing healthcare professionals and future doctors.

Table 1. Overview of accepted publications based on the projects presented in this dissertation.

Project 1 Spányik, A., Simon, D., Rigó, A., Griffiths, M. D., & Demetrovics, Z. (2022). Subjective COVID-19-related work factors predict stress, burnout, and depression among healthcare workers during the COVID-19 pandemic but not objective factors. *PLoS One*, *17*(8), e0270156.
Project 2 Spányik, A., Simon, D., Rigó, A., Griffiths, M. D., & Demetrovics, Z. (2023). Emotional exhaustion and traumatic stress among healthcare workers during the COVID-19 pandemic: longitudinal changes and protective factors. *PLoS One*, *18*(12), e0291650.
Project 3 Spányik, A., Simon, D., Rigó, A., Gács, B., Faubl, N., Füzesi, Z., ... & Demetrovics, Z. (2025). Cynicism among medical students: An in-depth analysis of mental health dynamics and protective factors in medical education using structural equation modeling. *PLoS One, 20*(4), e0321274.

3. General introduction

3.1. Relevance of the topic: Occupational stress and its mental health consequences among healthcare workers

The overall aim of the research presented in this dissertation is to describe the sources of stress experienced by healthcare workers (HCWs) and the diverse effects of workplace stress on mental health. In addition, a key objective of the dissertation is to explore individual, organizational, and early socialization protective factors that can help maintain the mental health of healthcare workers. Mental health problems among healthcare workers have become a growing concern due to increasing recognition of the psychological burden associated with their profession.

Work-related stress is significantly higher among HCWs compared to the general population, leading to a range of mental health complications, including depression, anxiety, post-traumatic stress disorder (PTSD), and burnout (Healy & McKay, 2000; Ito et al., 2014; Laranjeira, 2012). These issues not only affect HCWs' well-being but also have serious implications for patient care, workplace efficiency, and healthcare systems (Healy & McKay, 2000; Ito et al., 2014; Laranjeira, 2012).

Stress at work is a frequently studied psychosocial risk factor that occurs when a worker's resources are exceeded and can no longer cope with their demands (Leka, 2003). Prolonged, chronic stress has a wide variety of negative consequences for the mental and physical health of the worker and for the workplace organization (Leka et al., 2010). In particular, workers who perform responsible work with high emotional strain, such as HCWs, are at significant risk (Hegedűs, 2008). HCWs worldwide are exposed to significant stressors in their work, which adversely affect both the mental and physical health of workers (National Institute for Occupational Safety and Health [NIOSH], 2024).

Factors such as intense workloads, long working hours, emotionally stressful incidents, and the moral dilemmas often experienced in the healthcare sector contribute to workplace stress. Healthcare work is often associated with long shifts and overtime; overall, HCWs are exposed to a heavy workload, partly due to staff shortages, which contributes significantly to stress (Kivimäki et al., 2015). Another significant source of workplace stress is emotional strain: HCWs are daily exposed to major emotional strain-related illnesses (Delgado et al., 2010).

Moreover, a phenomenon that frequently occurs among HCWs is moral injury, which refers to the situation in which a worker must work under conditions or make decisions that conflict with his or her ethical and moral beliefs (Delgado et al., 2010). Such situations arise, for example, when patient care needs exceed the resources available or when specific rules prevent the professional from providing appropriate care to his or her patient (Delgado et al., 2010). This type of stress can contribute to burnout, career dropout, and increased turnover (Delgado et al., 2010).

The effects of chronic stress among HCWs can be wide-ranging and severe. A significant physiological effect of stress is the sustained elevation of cortisol levels, driven by activation of the hypothalamic-pituitary-adrenal (HPA) axis (Chrousos, 2009). Elevated cortisol levels, in turn, exert their damaging effects through metabolic disturbances, immune system impairment, and inflammatory responses (Juster et al., 2010). A large metaanalysis has also identified chronic work stress as an independent risk factor for cardiovascular disease (Kivimäki et al., 2012).

Beyond somatic consequences, chronic stress among HCWs is strongly associated with psychological outcomes. Persistent workplace stress can contribute to the development of mood disorders such as depression and anxiety, especially in cases where workers experience little control over their work environment or lack adequate support (Salvagioni et al., 2017). Another metaanalysis found that persistent stress among healthcare workers was significantly associated with higher rates of depressive symptoms, anxiety disorders, and sleep disturbances (Pappa et al., 2020). In addition, a metaanalysis published during the COVID-19 epidemic in 2021 also demonstrated that stress among HCWs is significantly associated with depressive symptoms and higher rates of anxiety disorders and sleep disturbances (Zaçe et al., 2021).

A recent systematic review reported that psychiatric morbidity among physicians ranged from 17% to 52%, highlighting the critical need for targeted mental health interventions in the medical profession (Imo, 2017).

In the following chapters, this dissertation examines how profession-specific stressors contribute to these mental health outcomes and investigates individual, organizational, and early professional socialization factors that may function as protective mechanisms against stress-related psychological deterioration.

3.2. Specific mental health challenges among healthcare professionals

3.2.1. Burnout Syndrome among Healthcare Workers

The term burnout was first used by Herbert Freudenberger in 1974, and the currently accepted definition was developed by Christina Maslach and colleagues, who define burnout as a psychological syndrome that occurs primarily in people in helping professions as a result of prolonged emotional and interpersonal stress (Maslach et al., 2001). Burnout Syndrome is also defined as an occupational diagnosis in the WHO's International Classification of Diseases (ICD-11) and is characterized by three main dimensions: emotional exhaustion, cynical or pessimistic attitudes toward work (cynicism), and a reduced sense of efficacy (WHO, 2019). Maslach et al. (2001) describe burnout syndrome as having three dimensions.

1. Emotional exhaustion (EE): the individual feels drained and lacks the energy to cope with work tasks.

2. Depersonalization (DP): the relationship with the patient becomes emotionally distant, cynical.

3. Feelings of personal ineffectiveness or reduced personal accomplishment (PA): the worker feels that his/her work is becoming meaningless and his/her sense of efficacy and self-confidence is diminished.

Risk factors and contributing factors of burnout

Several workplace and individual factors contribute to the development of burnout syndrome (Maslach et al., 2001), including feelings of persistent time pressure and overload, monotonous tasks, lack of organizational recognition, a conflictual or unsupportive work environment (Ruiz-Fernández et al., 2020), and deficits in personal coping strategies (Maslach et al., 2001). HCWs are particularly affected by burnout syndrome, as they often encounter human suffering and death and are often confronted with situations that create ethical dilemmas (Williams et al., 2020). Even before the COVID-19 outbreak, it was known that the prevalence of burnout among HCWs was very high compared to the general population, with a review study showing that burnout levels among HCWs can be as high as 60 percent (Mohanty et al., 2019).

Research among HCWs has shown that EE rates are higher among workers who work longer hours, under time pressure, or with low peer support (Dyrbye et al., 2017).

Associated symptoms and psychological correlates

Among HCWs, EE is of particular importance as it may be a predictor of the development of depression, elevated sleep disturbance, anxiety disorders, and psychosomatic symptoms (Koutsimani et al., 2019; Schonfeld et al., 2019). At the individual level, in addition to an increased risk of depression and anxiety disorders, the likelihood of secondary traumatization and psychosomatic illnesses is increased (Cieslak et al., 2014; Serrano-Ripoll et al., 2020).

Organizational and long-term consequences

The syndrome's significance is due to several significant consequences at both individual and workplace levels. There are organizational-level effects such as increased turnover, increased time spent on sick leave, or a deterioration in the quality of patient care (Dyrbye et al., 2017; Salyers et al., 2019).

The organizational-level effects of burnout among health workers have significant consequences. HCWs who suffer from burnout are less empathetic, which increases the likelihood of errors occurring, decreases patient satisfaction, and may even put patients' health at risk (Panagioti et al., 2018). Furthermore, burnout may also contribute to increased workplace conflict, leading to a decline in the quality of patient care and increased turnover through a deterioration in the workplace atmosphere and teamwork (Salyers et al., 2019).

3.2.2. Depression among healthcare workers

Depression is a prevalent mental disorder that affects emotional state, thinking, and even behaviour (Tolentino et al., 2018). The diagnostic criteria include loss of pleasure, feelings of sadness, loss of interest, and sleep disturbances (Tolentino et al., 2018).

The Diagnostic and Statistical Manual of Mental Disorders (DSM) defines the diagnostic criteria for depression, with the current edition of the DSM-5 in force. Diagnostic criteria

are met if at least five symptoms persist for two weeks, one of which is either depression or inability to show interest or pleasure (American Psychiatric Association, 2013).

Additional symptoms include changes in appetite or weight, sleep disturbances, psychomotor agitation or fatigue, feelings of worthlessness or excessive guilt, reduced ability to concentrate, and recurrent thoughts of death (American Psychiatric Association, 2013).

Depression has been identified as a significant public health problem worldwide (Hasin et al., 2018). Comprehensive international studies have estimated the lifetime prevalence of depression to be between 5-17% (average 12%), with a significantly higher prevalence in women (Hasin et al., 2018). One study found that 20-25% of women experience a depressive episode in their lifetime, compared to a significantly lower percentage of men, between 7-12% (Kessler, 2003).

Depression among HCWs is also a significant problem: a systematic review found the prevalence of depression among HCWs to be 33%. At the same time, another study estimates the prevalence of depression among HCWs to be between 29-32%, substantially higher than the average population (Abraham et al., 2021; Fond et al., 2022).

Several risk factors related to specific work conditions, such as long working hours, shift work (irregular shifts), and high emotional demands, can be identified as underlying the high morbidity rates among HCWs (Abraham et al., 2021; Saade et al., 2022). However, subjective factors such as job insecurity or lack of autonomy in decision-making can also contribute significantly to the development of depression (Saade et al., 2022). In addition to these, interpersonal factors at work, such as lack of managerial support or bullying, have also been shown in several studies to play a role in the development of depression among HCWs (Fond et al., 2022; Saade et al., 2022).

Other individual factors that may also increase the risk of developing depression among HCWs include pre-existing somatic illness, depression, or other mental health problems in earlier life (Norhayati et al., 2021; Tian et al., 2023). The relevance of the topic goes beyond aspects related to the health of HCWs, as several studies have shown that higher rates of depression among workers contribute to higher malpractice rates but may also have a negative influence on compliance through deterioration of the doctor-patient relationship (Abraham et al., 2021; Pereira-Lima et al., 2019).

3.2.3. Interrelationship of burnout syndrome and depression

Depression is one of the most prevalent mental health disorders among HCWs, with cross-sectional studies estimating its prevalence between 36.4% and 61.7% (Gao et al., 2011). Chronic exposure to occupational stressors has been strongly associated with the development of clinical depression among HCWs (Mészáros et al., 2013).

Although burnout and depression are classified as distinct psychological conditions, they frequently co-occur, and numerous studies have documented a strong relationship between the two (Iacovides et al., 2003). Burnout, characterized by emotional exhaustion, depersonalization, and reduced personal accomplishment, is often regarded as a precursor to depression (Iacovides et al., 2003).

Research indicates that persistent job-related stress and burnout can significantly increase the risk of developing depressive symptoms (Iacovides et al., 2003). In fact, the overlap between burnout and clinical depression has led some scholars to argue that burnout may represent an occupational subtype of depression rather than a separate entity (Schonfeld et al., 2019).

Job dissatisfaction has also been identified as a critical factor in the stress–burnout–depression pathway (Tokuda et al., 2009). Studies suggest that job dissatisfaction plays a more substantial role in the onset of depression than excessive workload alone, with burnout serving as a mediating factor in this relationship (Tokuda et al., 2009). Emotional exhaustion (EE), a key component of burnout as measured by the Maslach Burnout Inventory (MBI), has been found to have the strongest correlation with depression. Higher levels of EE significantly increase the likelihood of psychiatric morbidity among HCWs, further exacerbating the negative consequences of occupational stress (Schonfeld et al., 2019).

Several studies have investigated the relationship between depression and burnout, with meta-analyses summarizing the two entities showing significant correlation and shared characteristics (Koutsimani et al., 2019). However, the strength of the correlation suggests that they may be considered two separate pathologies (Koutsimani et al., 2019).

A meta-analysis of burnout in nurses also suggests a significant correlation between burnout and depression, with a high correlation for the emotional exhaustion subscale

(Chen et al., 2021). Thus, as highlighted by the comprehensive meta-analysis by Koutsimani et al. (2019), burnout and depression overlap in many symptomatic and diagnostic aspects; however, the two entities are distinct. The most apparent aspect of this distinctness is that symptoms of burnout are primarily related to workplace and work-related factors, whereas depression is a much more pervasive disorder (Koutsimani et al., 2019).

The relationship between burnout and depression is worth investigating because of their diagnostic overlap and the importance of temporal associations. Results from a follow-up study show that burnout syndrome can be considered a precursor of depression, with a less significant association in the other direction, and burnout can therefore be considered a separate risk factor for depression (Hakanen & Schaufeli, 2012). As discussed in previous chapters, both burnout and depression rates among HCWs are very high (Abraham et al., 2021; Fond et al., 2022; Williams et al., 2020). A large meta-analysis has shown that the prevalence of both burnout and depression among HCWs is high, and the correlation between the two conditions is significant, with burnout being a major contributor to depression (Fond et al., 2022).

3.3. Protective factors in mitigating mental health risks among Healthcare Workers

Protective factors mitigating mental health risks among healthcare workers operate at multiple interacting levels, including organizational, individual psychological, and developmental (professional socialization) domains. Rather than functioning in isolation, these factors dynamically interact with occupational stressors and shape long-term vulnerability or resilience trajectories among HCWs (Omri et al., 2022; Ruiz-Fernández et al., 2020).

3.3.1. Institutional protective factors

The role of institutions and organizational interventions in ensuring health workers' mental well-being is paramount. A supportive organizational culture, transparent and fair leadership, and a sense of autonomy in the workplace can contribute to reducing stress (West et al., 2018). Optimizing workload, including reducing working hours overtime, can also contribute to reducing stress and subsequent burnout and job satisfaction (Dyrbye et al., 2017). Some studies point out that preventive interventions are critical and beneficial for physicians in the early stages of career socialization (Panagioti et al., 2018).

The protective effect of adequate organizational-level support is also shown to be significant among HCWs, especially in workplaces with a high risk for burnout, such as emergency departments or intensive care units (Panagioti et al., 2018). In addition, adequate managerial support and a safe leadership attitude that includes the opportunity to openly discuss mistakes have also been associated with lower emotional exhaustion and higher satisfaction (Shanafelt et al., 2015). These organizational characteristics are thought to exert their protective effects primarily by increasing perceived control, psychological safety, and professional meaning, thereby buffering the impact of chronic occupational stress on emotional exhaustion and burnout (West et al., 2018; Zaçe et al., 2021).

3.3.2. Psychological resilience and coping strategies

In addition to coping and preventive strategies at the organizational level, coping at the individual level also plays a significant role in the development of adverse mental health outcomes among HCWs (De Brier et al., 2020).

Psychological resilience is an individual's ability to adapt quickly to traumatic or significantly challenging situations and to restore previous psychological equilibrium (Robertson et al., 2015). For HCWs, resilience is crucial because HCWs are exposed to significant stress, time pressures, and ethical dilemmas in their work (De Brier et al., 2020; Labrague, 2021).

Research has also shown that more resilient HCWs are at lower risk of anxiety and depression and that resilience has a protective role in burnout (De Brier et al., 2020; Labrague, 2021). The role of peer support and a sense of control in increasing resilience among HCWs has been highlighted in research (De Brier et al., 2020). Several studies emphasize the protective role of compassion satisfaction (CS) in maintaining mental health, particularly in reducing anxiety and burnout symptoms among healthcare professionals (Omri et al., 2022; Ruiz-Fernández et al., 2020). Compassion satisfaction refers to the positive emotional experiences, sense of fulfilment, and professional meaning derived from helping others and performing caregiving activities effectively (Stamm et al., 2010). In healthcare settings, CS reflects the extent to which professionals perceive their work as rewarding, valuable, and personally meaningful, thereby contributing to psychological resilience and professional well-being (Stamm et al., 2010).

Beyond its affective components, emerging evidence suggests that compassion satisfaction functions not merely as a positive emotional state but as a structural protective mechanism capable of attenuating the progression from occupational stress to burnout and secondary traumatic stress (West et al., 2018; Zaçe et al., 2021). CS is reinforced by the social esteem surrounding their work, the social importance of the helping profession, and good working relationships (Ruiz-Fernández et al., 2020).

Importantly, consistent with this multilevel framework, several studies indicate that preventive interventions are particularly effective during early professional socialization, suggesting that medical education represents a critical developmental window for shaping long-term coping patterns and vulnerability trajectories among healthcare workers (Passi & Johnson, 2016; Batt-Rawden et al., 2013).

3.4. The psychological impact of pandemics on Healthcare Workers

3.4.1. The effects of pandemics on HCWs' mental health

The general mental health aspects of HCWs, as discussed in the previous chapter, are of particular relevance in the presence of a health crisis, particularly in the event of an epidemic (Brooks et al., 2018; Liu et al., 2012). Pandemics create an extreme working environment in which existing mental health challenges are intensified, and health workers face new problems (Brooks et al., 2018; Chen et al., 2021; Liu et al., 2012). In the context of such a crisis, health workers face not only increased workloads and unpredictable, constantly changing work environments but also the effects of emotional stress, including the secondary trauma of endangering their health and caring for critically ill patients (Brooks et al., 2018; Chen et al., 2021; Liu et al., 2012). These conditions contribute to an increased probability of developing PTSD, secondary traumatization, burnout, anxiety, and depression (Chen et al., 2021).

Even before the COVID-19 epidemic, the long-term adverse effects of epidemic situations on the mental health of healthcare workers were already observed in the case of the 2003 severe acute respiratory syndrome (SARS) epidemic or the 2015 Middle East respiratory syndrome (MERS) epidemic (Lee et al., 2018; Liu et al, 2012). Several studies of previous outbreak situations have identified significantly increased psychological risks among frontline health workers.

A systematic review study by Brooks et al. (2018) found that frontline health workers during epidemics are affected by significantly increased level of anxiety, depressive symptoms, and burnout, among other symptoms. The review article also suggests that occupational, managerial, and psychological factors such as fear of infection, lack of support at work, and moral injury play a crucial role in increased psychological morbidity among frontline HCWs in epidemical outbreaks.

Research conducted by Liu et al. (2012) in the context of the SARS epidemic showed that several subjective factors, such as altruistic acceptance of risk and perceived exposure to danger, may also predict the presence of subsequent depressive symptoms. These symptoms may be present up to three years after the epidemic, pointing to the phenomenon that similar health crises may have long-term mental health effects among HCWs. Similarly, in the context of the 2015 MERS outbreak, the likelihood of PTSD among frontline healthcare workers working with infected patients was shown to be significantly increased, underscoring the importance of psychological preparation for healthcare workers (Lee et al., 2018).

Several studies highlight the impact of organizational and individual-level stressors associated with epidemics, which require specific interventions. These mental health problems are, therefore, often cumulative, and their effects continue to be felt after the epidemic period has passed (Brooks et al., 2018; Lee et al., 2018).

3.4.2. Specific psychological consequences among HCW's during the COVID-19 pandemic

The COVID-19 pandemic has placed a significant mental health burden on HCWs, especially those who have had direct contact with infected patients. According to a comprehensive umbrella review, the prevalence of anxiety among HCWs was 24.9%, while that of depression was 24.8% (Sahebi et al., 2021), indicating a substantially elevated psychological burden compared to prevalence rates generally observed in the wider population (World Health Organization [WHO], 2023). In a different study, professionals directly exposed to COVID-19 patients scored higher on the Maslach Burnout Inventory (MBI) and the Perceived Stress Scale (PSS) than their non-frontline colleagues (Ruiz-Fernández et al., 2020). Interestingly, a Chinese study reported lower

levels of burnout among frontline workers, which could be explained by a greater sense of control and more accurate information (Wu et al., 2020).

Several studies have addressed the varying effects of viral outbreaks on mental health among doctors and nurses. Studies on the SARS outbreak (2003) and COVID-19 reported worse mental health outcomes for nurses (Lai et al., 2020; Maunder, 2004). A Spanish study using the Professional Quality of Life Scale found higher compassion fatigue and burnout levels among nurses than doctors (Ruiz-Fernández et al., 2020). However, other studies have shown the opposite results, with higher stress and depression scores among doctors (Salari et al., 2020).

These differences can be partly explained by moral injury, a psychological distress that occurs when professionals are forced to make decisions that go against their ethical principles (Williams et al., 2020). Moral injury is associated with an increased risk of PTSD and depression (Bryan et al., 2018). A typical example during the epidemic was the lack of intensive care capacity, which forced physicians to make difficult triage decisions (Williams et al., 2020).

It is also worth highlighting that uncertainty, lack of protective equipment, and inadequate isolation protocols also increased levels of stress and anxiety among workers (Du et al., 2020; Sahebi et al., 2021). Nevertheless, few studies have examined the relationship between objective (e.g., job classification, job role) and subjective (e.g., uncertainty, unpredictability) factors with depression and burnout in a complex model (Pappa et al., 2020; Sahebi et al., 2021).

3.4.3. Anxiety and depression during COVID-19 pandemic among HCWs

Several meta-analyses highlight that levels of depression and anxiety among frontline HCWs have increased significantly, particularly among frontline HCWs in direct contact with patients (Sahebi et al., 2021; Saragih et al., 2021). A comprehensive umbrella review found that the prevalence of anxiety disorders among HCWs during the COVID-19 pandemic was 24.9 percent, and the prevalence of depression was 24.8 percent (Sahebi et al., 2021) indicating substantially higher rates than those generally observed in the wider population (World Health Organization [WHO], 2023).

Another systematic review found even worse rates of anxiety and depressive symptoms in some regions, which the review suggested were due to inadequate information, lack of protocols, and lack of protective equipment (Pappa et al., 2020). Objective factors such as increased workload, working directly with severely ill patients, and increased risk of infection considered to be behind the increased prevalence of anxiety and depression (Brooks et al., 2018). In addition, subjective factors can also be identified as underlying the increased prevalence, such as unpredictability or the subjective experience of lack of information (Du et al., 2020). Of particular note, rates of depressive and anxiety symptoms increased not only among frontline HCWs during the epidemic but also among those not working in direct COVID-19 care (Horn et al., 2021; Norhayati et al., 2021).

Another important finding of this study is that a sense of unpredictability played a significant role in the increased morbidity among these workers, with restructuring of the entire healthcare system, for example, contributing significantly (Horn et al., 2021). The presence of anxiety and depressive symptoms, in addition to having wide-ranging holistic consequences if they persist, can also contribute significantly to, among other things, a decrease in work engagement and thus an increase in turnover (Shah et al., 2022).

3.4.4. Burnout Syndrome during COVID-19 pandemic among HCWs

As previously discussed, the prevalence of burnout among HCWs was found to be very high prior to the pandemic. However, the COVID-19 pandemic has also resulted in the emergence of several new stressors and the exacerbation of pre-existing stress factors in the HCW cohort (Morgantini et al., 2020; Zhu et al., 2023).

A US study found that the rate of emotional exhaustion (EE) among physicians rose from 32% before the pandemic to 40% by 2022, with an even higher rate of 50% among nurses during the pandemic (Sexton et al., 2022). Meta-analyses and international studies conducted during the epidemic period also demonstrated remarkably elevated burnout rates among HCWs compared to levels typically observed in the general working population. One meta-analysis of data from 46 countries showed a 43.6% burnout rate, while another study of HCWs from 60 countries found an emotional exhaustion rate of 51% (Morgantini et al., 2020; Zhu et al., 2023).

The epidemic-related increase in burnout symptoms can be linked to several factors. The increased workload associated with the epidemic, the fear of infection and the lack of

protective equipment in the early stages of the pandemic, and the extreme increase in mortality rates among patients have all contributed to the increase in burnout among HCWs (Çivilidağ et al., 2024; Morgantini et al., 2020). Most studies found that burnout rates among HCWs working in frontline COVID-19 care were significantly worse compared to their colleagues working in non-COVID care (Macaron et al., 2023). Lack of peer support at work, low appreciation, feelings of insecurity and persistent fatigue also contributed to burnout (Galanis et al., 2021; Çivilidağ et al., 2024).

Overall, the alarming burnout symptoms among HCWs in the context of the COVID-19 pandemic have caused a parallel mental health pandemic with significant and long-term public health consequences (Sexton et al., 2022).

3.4.5. Secondary Traumatic Stress (STS) and Post-Traumatic Stress Disorder (PTSD) during COVID-19 pandemic among HCWs

Posttraumatic stress disorder (PTSD) is a trauma-related psychiatric disorder characterized by symptoms such as intrusive memories, hyperarousal, avoidance, and negative alterations in mood and cognition following exposure to traumatic events (American Psychiatric Association, 2013). PTSD is also an important psychological complication and consequence of epidemic situations involving significant emotional stress, and a meta-analysis has shown its prevalence to be significant among HCWs during previous epidemics (De Pablo et al., 2020). In a study by Xiao and colleagues, the prevalence of PTSD among frontline health workers during the SARS epidemic was 2–3 times higher than among all health workers (Xiao et al., 2020).

Lack of work experience, lack of safe working conditions, heavy workload, lack of support, and female gender alone have been identified as risk factors for developing PTSD in epidemic situations (d'Ettorre et al., 2021). It is important to highlight that the prevalence of suicide among people with PTSD is significantly higher, 2.5 times higher than in the general population (Thibodeau et al., 2013). The importance of this topic is further underlined by the fact that people with PTSD have difficulty seeking help, either due to lack of information or fear of stigma (Fuhr et al., 2020).

Secondary traumatization refers to trauma-related psychological symptoms that may develop through indirect exposure to another person's traumatic experiences, particularly in helping professions working closely with traumatized individuals (Figley, 1995). In

healthcare settings, HCWs may become especially vulnerable to secondary traumatization due to repeated empathic engagement with severely ill, suffering, or dying patients. In the context of the COVID-19 pandemic, secondary traumatization represented a substantial psychological burden for healthcare workers (İlhan & Küpeli, 2022).

3.4.6. Protective factors in supporting the mental health of health workers during the COVID-19 pandemic

Protective factors at the individual level

Certain protective factors at the individual or organizational level largely determined HCWs' resilience and resistance to mental health problems during the COVID-19 pandemic (West et al., 2016; Zaçe et al., 2021).

At the individual level, compassion satisfaction (CS) and resilience were the most significant protective factors against adverse mental health problems among HCWs (West et al., 2016; Zaçe et al., 2021). CS describes the sense of professional satisfaction and job-related pleasure that HCWs experience when caring for their patients, a positive psychological phenomenon often referred to as the emotional reward of caring for one's fellow human beings (Slocum-Gori et al., 2013). Several studies have demonstrated the protective role of CS against burnout during the COVID-19 pandemic (Dwyer et al., 2021; Omri et al., 2022). The protective role of CS has also been shown to be protective against STS in a study in the USA (Dwyer et al., 2021). A similar result was found in a Tunisian study: higher compassion satisfaction scores were associated with significantly lower burnout (Omri et al., 2022). This suggests that those who find more meaning and satisfaction in their vocation in the face of COVID-19 difficulties are more protected against burnout (Omri et al., 2022). However, several studies have also emphasized that typically, higher scores on CS in early-stage cross-sectional research may later decrease with fatigue or with a decrease in initial supportive attitudes toward HCWs (Zaçe et al., 2021).

However, other studies have shown that CS levels increased in some groups as the COVID-19 pandemic progressed, which the authors attributed to the strong motivation HCWs felt for social esteem and that this may act as a decisive protective factor against burnout through CS (Ruiz-Fernández et al., 2020). Therefore, it can be argued that CS is a protective factor for HCWs during significant stressful outbreak situations. Therefore,

it is worthwhile implementing interventions at the organizational level that increase CS to protect HCWs during high-stress situations (Lluch et al., 2022).

Protective factors at the organizational level

During the COVID-19 epidemic, creating a flexible, supportive work environment with a focus on managerial support, promoting work-life balance, and the availability of psychological support was identified as a key priority for protection at the organizational level (West et al., 2018; Zaçe et al., 2021). Reducing working hours, improving flexibility, ensuring reasonable task allocation, and providing adequate rest time in crisis situations may contribute to burnout prevention and psychological well-being among healthcare workers (West et al., 2016; West et al., 2018; Zaçe et al., 2021).

Leadership support and positive organizational culture

The prominent role of managerial support has been reported in several studies: Workers who felt their concerns were taken into account and adequately cared for showed significantly lower levels of depression and burnout symptoms (Chatzittofis et al., 2021). One study found that firm and adequate managerial exposure and support resulted in lower burnout rates among HCWs (Gilmartin et al., 2024). Emotional support from managers and staff involvement in decision-making contributes to a positive emotional climate, employee satisfaction, and protection against mental health problems (Gilmartin et al., 2024). Among workers who are listened to and valued, there is also a lower likelihood of career abandonment and an increase in resilience (Chatzittofis et al., 2021).

Psychological support and mental health services

Based on a systematic review by Zaçe et al., institutional-level interventions during the COVID-19 epidemic fall into four categories: information support (e.g., training, policy briefings), material support (e.g., protective equipment), organizational-level interventions (e.g., reallocation of working time) and emotional and psychological support (Zaçe et al., 2021).

Several countries provided psychological support programs for HCWs during the COVID-19 pandemic, such as psychological counseling, helplines, group psychological support, and online therapy platforms, which significantly mitigated the effects of the stress caused by the pandemic (Zaçe et al., 2021).

It is important to note that a combination of interventions proved to be the most effective prevention (Zaçe et al., 2021).

It is important to underline that it is not sufficient to provide crisis interventions alone: it is recommended that mental health support should be integrated at the organizational level in the long term (e.g., regular stress management training, provision of supervision) and that strategies for this are also needed at the national level (Zaçe et al., 2021).

The COVID-19 pandemic highlighted that the mental resilience of health workers is primarily determined by certain protective factors (West et al., 2018; Zaçe et al., 2021).

At the individual level, compassion satisfaction and resilience are the most important shields against burnout (Dwyer et al., 2021; Omri et al., 2022). At the organizational and policy level, the creation of a flexible and supportive working environment, including managerial support, promotion of work-life balance, and availability of psychological support, is essential (Zaçe et al., 2021). Empirical evidence supports that multidimensional interventions that combine these levels not only improve the well-being of individual health workers but also result in a more resilient and sustainable health system that is better able to meet the challenges of a future crisis (West et al., 2018; Zaçe et al., 2021).

3.5. Mental health challenges among medical students

Adverse mental health problems among medical students have been the subject of a wide range of previous research (Santen et al., 2010), with the primary focus of research being on the emotional burden of medical training and the consequences of career socialization, which can have a significant impact on the subsequent mental and physical health of medical professionals (McKerrow et al., 2020; Santen et al., 2010). In the context of medical training, studies have highlighted the high prevalence of public health problems such as sleep disorders, alcohol or drug dependence, anxiety disorders, and depression, which are also known to occur among HCWs (Moir et al., 2018). The high burnout rate previously presented in this thesis among HCWs is often already present during medical training, prior to career entry (Dyrbye et al., 2005; Newton et al., 2008; Peng et al., 2018).

The high level of burnout is further supported by the high suicide rate associated with the syndrome (Ishak et al., 2023). The significance of burnout during the student years

extends beyond health considerations for medical students, as high levels of burnout observed during medical training can have adverse effects on subsequent doctor-patient relationships (Pappa et al., 2020).

It has been suggested that elevated perceived stress levels among students play a significant role in developing high burnout levels (Dyrbye et al., 2005; Frajerman et al., 2019; Peng et al., 2018). Higher stress is also associated with increased academic demands and inadequate coping strategies (Jafari et al., 2012; Shapiro, 2011). Higher stress also contributes to increased cynicism and decreased idealism (Cuttilan et al., 2016; Jafari et al., 2012).

Cynicism also plays a prominent role among students because it can negatively affect the subsequent doctor-patient relationship and is of particular importance for the mental health of future doctors (Hershey & Stoddard, 2021). Therefore, this dimension is paramount for a good doctor-patient relationship and high-quality healthcare and can also be perceived as a defense mechanism against stressful situations (Hershey & Stoddard, 2021; Maslach & Leiter, 2016). Higher cynicism scores during training are associated with low patient satisfaction and reduced compliance (Shanafelt et al., 2002). Thus, high cynicism scores may develop due to elevated stress levels, poor coping strategies, and lower levels of empathy (Shanafelt et al., 2002). Institutional-level effects show that higher cynicism scores are associated with high job turnover and low job satisfaction (Leiter & Maslach, 2009).

3.5.1. The importance of career socialization in medicine

During medical career socialization, i.e., medical student's preparation for the medical profession, socialization involves significant psychological changes (Batt-Rawden et al., 2013; Gaufberg et al., 2010; Hafferty et al., 2009). Throughout the long and demanding training process, students are exposed to a range of influences from both the implicit and formal curriculum that will affect their perceptions and subsequent doctor-patient relationships (Batt-Rawden et al., 2013; Gaufberg et al., 2010; Hafferty et al., 2009).

The reinforcement of cynical attitudes is a common phenomenon during career socialization, which can also be seen as a coping mechanism to deal with emotional strain (Peng et al., 2018; Hershey & Stoddard, 2021). The initial idealism of students undergoes a process of de-idealization, whereby a dissonance develops between the values promoted

in formal curricula, such as empathy and patient-centredness, and clinical reality (Peng et al., 2018). Studies point out that cynicism partly results from the 'hardening' process of medical socialization, whereby students develop emotional detachment to cope with stress and uncertainty (Hershey & Stoddard, 2021).

The phenomenon of implicit curriculum is a major contributor to the development of cynicism (Silveira et al., 2019). Implicit curriculum refers to the knowledge and skills that students acquire from observing mentors during their college studies (e.g., specific types of physician-patient role models). Implicit curriculum refers to the organizational and institutional factors that shape students' education in subtle ways (Hafferty et al., 2009).

The hidden curriculum often mediates undesirable aspects of professionalism through empathic or cynical role models, thus promoting negative emotional states (Silveira et al., 2019).

Burnout can appear as early as the university years and becomes particularly prevalent during clinical practice. The triple symptom of burnout —emotional exhaustion, depersonalization (i.e., cynical depletion), and reduced personal effectiveness— is common among medical students, especially as training progresses (Almutairi et al., 2022). According to an international meta-analysis, the prevalence of burnout among medical students is as high as 37% (Almutairi et al., 2022). There is a strong correlation between depersonalization and cynicism and reduced empathy (Neumann et al., 2011).

Furthermore, overload, stress, and insensitive role models are behind the decline in empathy over the academic years, again highlighting the role of hidden curriculum (Howick et al., 2023). In addition, research highlights the protective effect of empathy against burnout: Students with higher empathy are less prone to depersonalization and emotional exhaustion (Neumann et al., 2011).

3.5.2. The role of empathy in medical career development

Empathy in medicine is a key skill that develops significantly during medical career socialization and has a protective effect on medical students in several aspects (Cairns et al., 2024; Chen et al., 2024). Empathy has also been shown to improve doctor-patient relationships, patient satisfaction, and doctor satisfaction (Newton et al., 2008; Batt-

Rawden et al., 2013). Based on the literature, two primary forms of empathy can be distinguished: emotional (vicarious) and cognitive (imaginative) (Newton et al., 2008). Emotional empathy is defined as an individual's emotional response to the suffering or other emotions of another (Mehrabian et al. Cognitive empathy is when an individual can understand others' situations, put oneself in the other's shoes, or even anticipate others' intentions (Davis, 1983). The decrease in empathy and the increase in cynicism levels can be partly attributed to the effects of a hidden implicit curriculum, the impact of which is also significant for the development of empathy (Batt-Rawden et al., 2013). In particular, cognitive empathy has been shown to have a protective effect on mental well-being. Research suggests that high levels of empathy are associated with psychological well-being and a lower risk of burnout (Cairns et al., 2024; Chen et al., 2024).

Results from a recent meta-analysis show that empathic students have both lower levels of emotional exhaustion and depersonalization and higher feelings of professional efficacy (Cairns et al., 2024). However, markedly high affective empathy can also have the opposite effect, increasing the risk of depression and anxiety disorders (Chen et al., 2024). The important role of empathy in later physician-patient relationships is predicted by the fact that their instructors perceive more empathic students as more competent (Chen et al., 2024). Both students and physicians with lower levels of empathy have higher burnout rates and, in parallel, lower patient satisfaction (Mercer & Reynolds, 2002; Newton et al., 2008). In light of this, the development of empathy is of paramount importance for the mental health of students and for the subsequent professional physician-patient relationship in medical education.

4. Overall objective

The PhD dissertation aims to provide a comprehensive framework for exploring the mental health challenges of HCWs and factors shaping their mental health. One of the main focuses of the research was to examine the impact of the COVID-19 pandemic—an unprecedented stress on the health sector—to deepen our understanding of the psychological consequences for health workers and strengthen our preparedness for similar crises. Furthermore, a key objective was to identify protective factors at the organizational and individual levels that could mitigate the effects of emotional distress among HCWs.

The findings contribute to our understanding of mental health risks in this population and provide valuable insights into workforce management, the dynamics of doctor-patient relationships, and predictors of patient satisfaction. Furthermore, by investigating medical career socialization in our research from a mental health and professional socialization perspective, we gain insights into how the early stages of medical career development affect mental health. These findings are relevant to the mental health of students and have important implications for future doctor-patient interactions and preventive implications for mental health.

5. Project 1: Subjective COVID-19-related work factors predict stress, burnout, and depression among healthcare workers during the COVID-19 pandemic but not objective factors

5.1. Aim of the present study

The first study in this thesis examined the mental health of healthcare workers during the COVID-19 pandemic. In the initial period of the pandemic, frontline workers were exposed to extreme psychological stress; therefore, we decided to conduct a large-scale, cross-sectional, nationwide survey (Brooks et al., 2018; Liu et al., 2012). This study provided a comprehensive picture of the most important risk and protective factors and laid the foundation for the conduct of subsequent longitudinal research.

Although a significant number of studies examining the mental health impact of COVID-19 on HCWs have been conducted during this period, very few studies have been conducted based on comprehensive systematic reviews that have examined the interrelationship of background factors with burnout, depression and anxiety (Pappa et al., 2020; Sahebi et al., 2021). The study's main objective was to investigate the background factors influencing adverse mental health outcomes, including subjective and objective factors. A complex, comprehensive model was used to process the data to better understand the background factors and the relationships.

The acute care of COVID-19 patients has been a significant burden on healthcare in Hungary. According to the Hungarian governmental webpage (koronavirus.gov.hu), the average number of new COVID-19 infections per million population during the study period was 257 (SD = 146). During the same period, the average number of hospital admissions per million people was 449 (SD = 83), and the average number of patients on ventilators per million people was 38 (SD = 11). The latest available official statistical data shows the number of acute hospital beds was 4271 per million inhabitants (Hungarian Central Statistical Office, 2017), which means more than 10% extra load for hospitals treating acute patients. Beyond the numerical increase in patient load, the pandemic also imposed considerable psychological and organizational stress due to high patient acuity, increased mortality, infection risk, workforce shortages, and continuous adaptation of healthcare services (Sahebi et al., 2021).

In addition to occupational stressors, the COVID-19 pandemic substantially affected the

private lives and social functioning of healthcare workers. Lockdown restrictions, social isolation, fear of infecting family members, illness or loss among relatives, disruption of everyday routines, and reduced access to usual coping and recreational activities further contributed to psychological distress among HCWs (Fageera et al., 2021). The pandemic therefore represented not only a professional crisis for healthcare workers, but also a major disruption of their personal and family lives.

Based on the aforementioned considerations, the aim of the present study was to examine the mental health status (including depression and burnout syndrome) of HCWs and its possible predictors related to the COVID-19 outbreak. Compared to previous studies (Pappa et al., 2020; Sahebi et al., 2021), the present one examined the relationship between mental health indicators and the possible predictive factors in a complex model (Fig 1). The goal was to examine the extent to which stress (directly and indirectly) explained depressive symptoms. Moreover, the proposed model aimed to (i) differentiate between the objective (e.g., displacement, frontline work) and subjective (e.g., uncertainty, unpredictability) COVID-19-related possible stress factors, as well as (ii) determine the differences between physician HCWs and non-physician HCWs.

5.2. Hypothesis

Aligned with the stated objectives, this study examines the factors influencing healthcare workers' mental health during the COVID-19 pandemic using a comprehensive model. Existing literature and pandemic experiences suggest that the psychological burden of the crisis is not exclusively attributable to objectively measurable working conditions; individual subjective experiences, including uncertainty and unpredictability, also significantly contribute (Pappa et al., 2020).

Accordingly, the model differentiates between objective working conditions related to COVID-19, such as relocation and frontline work, and subjective work experiences. It posits that these factors exert distinct effects on mental health outcomes, both directly and through mediating mechanisms. Stress plays a central role in the model, mediating the relationship between work conditions and burnout, and contributing both directly and indirectly to the development of depressive symptoms.

Within the conceptual framework, burnout is considered both an outcome variable and an intermediate mechanism that elevates the risk of developing depression under the

influence of prolonged stress. The model also accounts for the interaction between objective and subjective factors, assuming that objective working conditions influence individuals' subjective perceptions of stress.

The hypotheses for this cross-sectional study were developed in accordance with these conceptual considerations.

1. Objective work factors associated with COVID-19 (e.g., reassignment, frontline work) have both direct and indirect effects on levels of burnout and depression among HCWs (Morgantini et al., 2020; Ruiz-Fernández et al., 2020).

2. Subjective factors associated with COVID-19 (e.g., insecurity, unpredictability, workload) also directly and indirectly increase levels of burnout and depression (Di Monte et al., 2020; Di Trani et al., 2021).

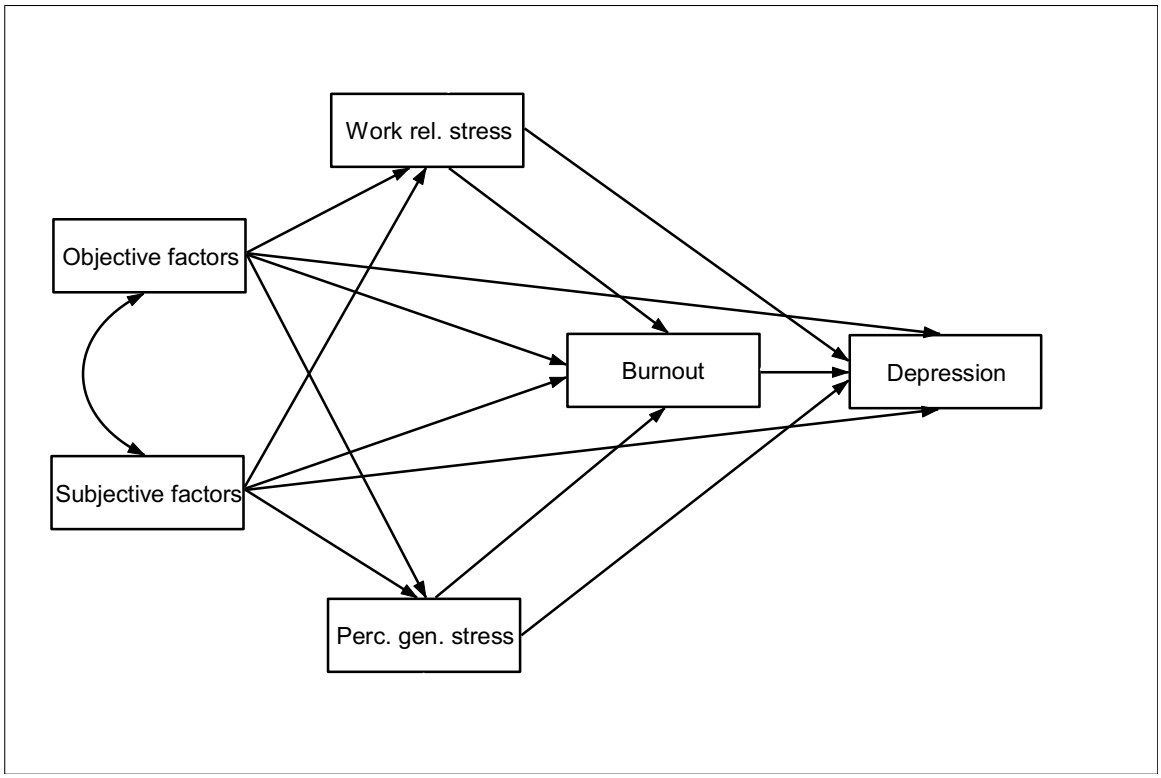
3. Work-related stress acts as a mediator between objective and subjective factors and burnout (Embriaco et al., 2007; Imo, 2017).

4. Perceived general stress acts in part as a mediating factor between COVID-19 work-related factors and depression (Tokuda et al., 2009).

5. Burnout appears as a mediating factor in the relationship between stress and depression, i.e., increased burnout significantly increases the odds of depression (Tokuda et al., 2009; Imo, 2017).

6. There is an interaction between subjective and objective factors: objective workplace conditions shape the individual's subjective experience (e.g., feelings of insecurity) (Di Monte et al., 2020; Di Trani et al., 2021).

Figure 1. Hypothetical model of COVID-19-related factors' possible effects on mental health



5.3. Methods

5.3.1. Participants

The link to the questionnaire was sent to members of the Hungarian Medical Chamber (MOK) and the Chamber of Health Care Professionals (MESZK). We surveyed between 14 January and 5 March 2021, between the second and third waves of the COVID-19 epidemic in Hungary. Among the respondents, data from those who completed at least 90% of the questionnaire were analyzed (N = 2260). During anomaly detection using the SPSS 'DETECTANOMLY' function, 64 respondents were excluded based on the response pattern of the psychometric scales. These patterns included highly homogeneous responding (e.g., identical responses across most items), inconsistent or apparently random response styles, and multivariate outlier response combinations that substantially differed from the overall response structure of the sample. A further 109 individuals declared that they were not working as doctors or health care workers were also excluded.

After screening, the final sample consisted of 2087 participants (female: 85.82%; male: 13.46%; n/a: 0.72%), with ages ranging from 21 to 87 years (mean age = 45.58 years;

standard deviation = 12.57 years). All respondents were active HCWs, with no retired persons included in the sample. A third of respondents (33.78%) worked as doctors, while 66.22% worked in non-medical health professions. 38.06% of the sample worked in departments directly involved in COVID-19 care (e.g., COVID departments, emergency departments, ambulance services), while 61.94% worked in non-COVID-related fields. Around one-sixth of respondents (16.72%) reported being transferred during the epidemic, while the majority (83.28%) remained in their original job.

5.3.2. Procedure

The study was conducted in full compliance with APA ethical standards, and the Research Ethics Committee of ELTE Eötvös Loránd University approved the research (2020/498). The data was collected online via the Qualtrics platform, the questionnaire was pre-tested with a small group of healthcare workers, and modifications were made where necessary based on the pilot results. A link to the final questionnaire was sent to members of the Hungarian Medical Chamber (MOK) and the Hungarian Chamber of Health Care Professionals (MESZK), together with a short leaflet explaining the purpose and process of the survey. Participation was voluntary, with respondents giving informed consent and being able to stop completing the questionnaire at any time. At the end of the questionnaire, participants were given personal feedback on the Beck Depression Scale, and professional help was made available to all attendees by a collaborating mental health service provider.

5.4. Measures

5.4.1. Background factors related to COVID-19

The background factors associated with COVID-19 were measured using a proprietary set of items developed by the research team. Two items assessed objective background factors: one asked whether the respondent had been involved in frontline work (in a COVID-19 department, whether in an intensive or non-intensive emergency department), and the other measured whether the respondent had had to change departments during the epidemic (i.e., had to work in a department other than the usual one).

Subjective background factors were assessed by three statements about the change in working conditions, which participants rated on a seven-point Likert scale from 1

(strongly disagree) to 7 (strongly agree). The first item was related to an increase in workload ("The amount of work I have to do has increased"), the second was linked to a decrease in the feeling of job security ("I feel less secure in my job"), and the third was related to the perception of unpredictability in my work schedule ("My work schedule has become more unpredictable").

5.4.2. The psychometric measurement tools used

The Perceived Stress Scale (PSS), a four-item shortened version of the Perceived Stress Scale (Stauder & Konkolÿ Thege, 2006), was used to assess perceived stress levels. The instrument contains two positive and two negative statements; each rated on a five-point scale from 0 (never) to 4 (very often). Positive statements were scored on a reverse scoring basis, with scale scores ranging from 0 to 16. The internal reliability of the instrument was found to be adequate (Cronbach's alpha = 0.80).

Work-related stress was measured using the Professional Quality of Life Scale (version 5) secondary traumatic stress subscale (ProQOL STS), which is part of the instrument developed to assess the quality of life of people working in the helping professions (Stamm, 2010; Hungarian version in Kegye et al., 2018). The ProQOL STS consists of ten statements that had to be rated on a five-point Likert scale from 1 (never) to 5 (very often). For example, "I am preoccupied with more than one person I help." The total score ranged from 10 to 50, and the scale has good internal reliability (Cronbach's alpha = 0.87).

The emotional exhaustion dimension of burnout was assessed using the Maslach Burnout Inventory - Human Services Survey (MBI-EE) subscale (Maslach, Jackson & Leiter, 1998; Hungarian adaptation: Ádám & Mészáros, 2012). The original subscale contains nine items that map the frequency of various work-related emotional strains. Responses were given on a seven-point scale, ranging from 0 (never) to 6 (every day). In the Hungarian version, item 14 did not fit the factor structure properly and was, therefore, omitted from the analysis. The possible scale score ranged from 0 to 48 (Cronbach's alpha = 0.94).

The presence of depression was measured with the nine-item abridged Hungarian version of the Beck Depression Questionnaire (BDI) (Beck & Beck, 1972; Rózsa & Szádoczky, 2001), which was validated by Kopp and colleagues (1990) on a Hungarian sample. Each item (e.g., "I am too tired to do anything.") was rated on a four-point scale ranging from

0 (not at all characteristic) to 3 (entirely characteristic). The total possible score ranged from 0 to 27, and the scale's reliability was also good (Cronbach's alpha = 0.86).

5.5. Statistical analysis

Descriptive statistics were calculated for all variables in the study (means and variances). Student's t-test was used to examine differences between means of physician and non-physician health care workers groups. Variables were considered to have a near-normal distribution if their skewness and peak were within ±2 (Gravetter & Wallnau., 2014). In the present study, the skewness and peak for all variables examined ranged from -1.76 to +1.79. Cronbach's alpha values were calculated to estimate the reliability of the psychometric scales. Correlation analyses were performed using Pearson correlation coefficients with two-sided significance tests. The significance threshold for statistical tests was set at $p<.05$. SPSS version 23 was used to calculate descriptive statistics, reliability analyses, and correlations.

Structural equation modeling (SEM) was used to test hypotheses. The estimation procedure was selected based on normality testing of the variables included. All paths that were not found to be significant ($p>0.05$) were removed from the model. Model fit was assessed using tests based on different likelihood ratios (base model vs. test model, saturated model vs. test model), and the following fit indices were used: root mean square error of approximation (RMSEA), comparative fit index (CFI), Tucker-Lewis index (TLI), goodness of fit index (GFI). The model was a good fit if RMSEA<0.06, TLI and CFI >0.95, and GFI >0.90. The model included standardized and unstandardized regression coefficients, as well as the overall effect (calculated from direct and indirect effects) and equation-level explained variance (R^2). We used bound and unbounded group structural equation models to test for structural invariance between physicians and non-physician health workers. All calculations of the SEM models were performed in Stata 14.

5.6. Results

5.6.1. Descriptive statistics and preliminary analyses

Table 2 shows the descriptive statistics for the variables under study. There were no significant differences between HCWs working as doctors and non-physician practitioners (HCWs) regarding objective background factors related to COVID-19. Regarding subjective background factors, HCWs reported an overall increased sense of uncertainty (M=4.89), but there was no statistically significant difference between physicians and non-physician HCWs in this respect. In contrast, non-physician HCWs perceived a significantly more substantial increase in workload (M=5.31) and an increase in work schedule unpredictability (M=4.72) than their physician counterparts (M=4.62; M=4.50). No significant differences were found between physicians and non-physician HCWs in terms of stress, work-related stress, and burnout, but non-physician HCWs reported significantly higher depression scores than physician HCWs.

Table 2. Comparative descriptive statistics of the study variables between physicians and non-physician HCWs

	Physicians			Non-physician healthcare workers			Total				
Variables	n	M	SD	n	M	SD	n	M	SD	Skewness	Kurtosis
1. Frontline	684	$.38_a$	.49	1,268	$.38_a$	.49	1,952	.38	.49	0.49	-1.76
2. Displaced	705	$.15_a$	.35	1,382	$.18_a$	.38	2,087	.17	.37	1.79	1.19
3. Insecurity	703	4.98_a	1.95	1,369	4.85_a	1.98	2,072	4.89	1.97	-0.57	-0.88
4. Unpredictability	702	4.50_a	2.24	1,371	4.72_b	2.21	2,073	4.64	2.22	-0.42	-1.29
5. Workload	700	4.62_a	2.18	1,376	5.31_b	1.95	2,076	5.08	2.05	-0.71	-0.77
6. Work-related stress (ProQoL STS)	675	23.59_a	7.40	1,285	24.20_a	7.57	1,960	23.99	7.52	0.45	-0.25
7. Perceived stress (PSS)	702	7.04_a	3.31	1,369	7.32_a	3.08	2,071	7.22	3.16	-0.09	-0.46
8. Burnout (MBI EE)	701	23.80_a	13.26	1,372	24.91_a	12.93	2,073	24.54	13.05	-0.01	-1.01
9. Depression (BDI)	705	6.64_a	5.20	1,381	7.32_b	5.24	2,086	7.09	5.24	0.58	-0.44

Note. Means for physician HCWs and non-physician HCWs in the same row not sharing the same subscript are significantly different at $p<.05$ in the two-sided test of equality for column means. Cells with no subscript are not included in the test. Tests assume equal variances. ProQol STS: Professional Quality of Life Scale, Compassion Fatigue subscale; PSS: Perceived Stress Scale; MBI EE: Maslach Burnout Inventory for Human Service Survey; BDI: Beck Depression Inventory

Table 2 shows the Pearson correlation coefficients between all variables measured in the study. A population-level correlation of 0.07 with a type II error of 0.05% is also detected based on the preliminary statistical power analysis. The analyses showed that most correlations were significant, with a few exceptions: no significant relationship was found between age and increasing sense of insecurity, and between gender and three factors: (i) frontline work, (ii) transfer to another department, (iii) increasing unpredictability of work schedule. There were high and statistically significant correlations between perceived stress, work-related stress, burnout and depression (.55-.72). The associations between COVID-19-related subjective background factors and indicators of mental well-being were of medium strength (.22 and .38), except for a weak correlation between workload increase and work stress (.19). Only weak correlations were found between objective COVID-19 factors and mental well-being indicators (.08-.17). However, the two objective factors were strongly correlated with each other (.44). In contrast, moderate-strength correlations were found between subjective background factors (.23 to .37).

Table 3. Pearson correlations for study variables

Variables	n	1	2	3	4	5	6	7	8	9	10	11
1. Age	2,006	-										
2. Sex	2,072	-.07**	-									
3. Frontline [a]	1,952	-.34**	-.09**	-								
4. Displaced [b]	2,087	-.19**	.07**	.44**	-							
5. Insecurity	2,072	-.02	.05*	.00	-.01	-						
6. Unpredictability	2,073	-.18**	.03	.22**	.20**	.31**	-					
7. Workload	2,076	-.11**	.14**	.21**	.14**	.23**	.37**	-				
8. Work-related stress (ProQoL STS)	1,960	-.12**	.14**	.08**	.09**	.29**	.23**	.19**	-			
9. Perceived stress (PSS)	2,071	-.25**	.13**	.12**	.10**	.29**	.31**	.23**	.55**	-		
10. Burnout (MBI EE)	2,073	-.27**	.11**	.16**	.13**	.34**	.38**	.32**	.58**	.66**	-	
11. Depression (BDI)	2,086	-.27**	.10**	.17**	.14**	.28**	.33**	.22**	.59**	.72**	.72**	-

Note.
[a] 0=not working in the frontline 1=working in the frontline
[b] 0=were not displaced 1=were displaced
* $p<.05$, ** $p<.01$
ProQol STS: Professional Quality of Life Scale, Compassion Fatigue subscale; PSS: Perceived Stress Scale; MBI EE: Maslach Burnout Inventory for Human Service Survey; BDI: Beck Depression Inventory

5.6.2. Structural equation model

The maximum likelihood (ML) estimation procedure, which can also handle missing data, was used to fit the model as all preconditions were met. The fit indicators summarised in Table 4 indicated a good fit for the final model. The free (unconstrained) multigroup model tested for a separate group of doctors and non-physician health workers also showed a good fit. The constrained multigroup model assuming equality of structural paths and variance of error terms also showed good fit on all fit indicators except for the χ^2 test. However, the χ^2/df was 2.1, which is close to or in line with recommended limits (Kline, 2015).

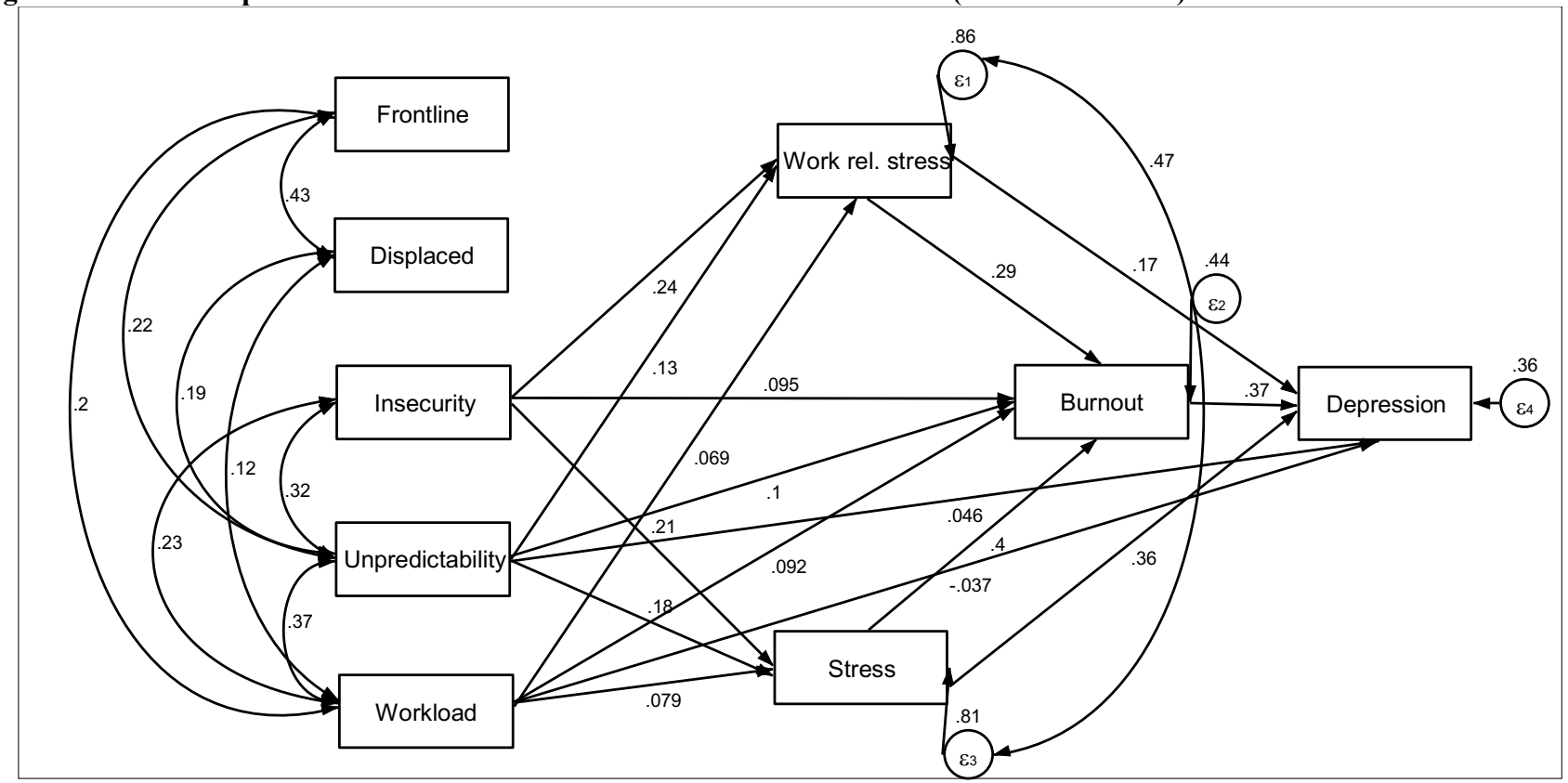
Table 4. Fit statistics for the structural equation models

Model	χ^2	*df*	*P*	CFI	TLI	GFI	RMSEA	Model AIC
Final full model	18.45	11	.072	.99	.99	.99	.018 (90% CI: .000, .031)	96516.8
Unconstrained multigroup model	33.10	22	.060	.99	.99	.99	.022 (90% CI: .000, .037)	94786.2
Multigroup model assuming structural invariance	111.20	53	.000	.99	.99	.98	.032 (90% CI: .024, .041)	94782.0

In the final structural equation model (see Figure 2), no significant relationship was found between objective factors associated with COVID-19 and mental health indicators. However, these objective factors were weakly or moderately significantly correlated with COVID-19-related subjective factors. One of the subjective background factors, increased sense of insecurity, had a medium-strong positive direct effect on perceived stress and work-related stress (effect size between 0.21 and 0.24), a weak direct effect on burnout, and no significant effect on depression. Another subjective factor - increased unpredictability - had a weak positive direct effect on perceived stress, job stress, burnout, and depression (values between 0.05 and 0.18). The third factor, increased workload, showed a weak positive direct effect on perceived stress, job stress, and burnout (0.07-0.09) and a weak negative effect on depression (-0.04).

When direct and indirect effects were examined together (Table 4), all subjective factors associated with COVID-19 showed positive effects on both burnout and depression. Two factors —an increased sense of uncertainty and unpredictability— had a moderate effect on burnout and depression, while workload had a weaker, milder effect on these indicators.

Figure 2. Relationship between COVID-19 related factors and mental health (final SEM model)



Note. Control variables (age, sex) and non-significant correlations are not presented. Figure shows standardized coefficients, correlations and variances of error terms. $\varepsilon_{1\text{-}4}$ *error terms of the four equations.*

The model showed that perceived stress had a strong overall effect on burnout and depression, while work-related stress had a moderate overall effect on the same outcome variables. The explained variance was 64% for depression, 56% for burnout, 14% for job stress, and 19% for perceived stress. The coefficient of determination of the overall model was 0.31.

Table 5. Total effects of COVID-19-related subjective factors, stress, and control variables on burnout and depression

		Std. Coeff.	z	*p*>|z|
Burnout	Perceived stress	.40	21.70	.000
	Work-related stress	.29	15.80	.000
	Insecurity	.25	12.35	.000
	Unpredictability	.21	10.04	.000
	Workload	.14	7.02	.000
	Age	-.20	-10.16	.000
	Sex	.07	5.44	.000
Depression	Burnout	.37	18.87	.000
	Perceived stress	.51	26.03	.000
	Work-related stress	.28	14.99	.000
	Insecurity	.21	12.85	.000
	Unpredictability	.21	9.71	.000
	Workload	.06	2.65	.008
	Age	-.19	-9.56	.000
	Sex	.07	5.38	.000

5.7. Discussion

The SEM model partially confirmed the hypothesized model of the impact of objective and subjective factors associated with COVID-19 on stress, burnout, and depression. The results showed that both general perceived and work-related stress increased burnout, confirming previous research findings (Embriaco et al., 2007; Imo, 2017). Furthermore, both general perceived stress and work-related stress were directly and indirectly associated with depression, as previously reported by Tokuda et al. (2009).

Objective factors associated with COVID-19 (e.g., frontline work or transfer) did not show a direct effect on either stress, burnout, or depression. Instead, the results suggest that the adversities of the epidemic situation affect mental health primarily through subjective experience. A key conclusion of the model is that the impact of stressors is not direct but mediated by individual perception and interpretation. This highlights the importance of mental hygiene for healthcare workers during extreme crises and underscores the central roles of organizational communication and psychological support. Our results are consistent with previous research literature highlighting the adverse effects of feelings of uncertainty on the mental health of health workers (e.g., Di Monte et al., 2020; Di Trani et al., 2021).

These findings point toward important individual —and organizational— level intervention opportunities. The results imply possibilities for action for healthcare management and underscore the importance of professional organizational communication related to patient care in healthcare institutions. Another important lesson is that providing professional information on COVID-19 care could have contributed to lower stress levels and safer patient care among healthcare workers by fostering a greater sense of control.

The research found no differences between physician and non-physician HCWs in the ways in which COVID-19-related factors can cause stress, burnout, and depression, suggesting that background factors have similar structural effects across professional groups. However, non-physician HCWs perceived higher levels of insecurity and stress and reported higher depression scores, while there was no difference in stress and burnout levels. The meaning of these seemingly contradictory results is clarified by the pathway

model: since there was no significant difference in the level of the mediating variables (stress, burnout), the difference emerged only at the level of the outcome (depression).

These findings highlight the more vulnerable position of non-medical healthcare workers, warranting special consideration in planning workplace communication and adequate supervision. The provision of specific mental health supervision may also be considered, with particular attention to more vulnerable populations.

6. Project 2: Emotional exhaustion and traumatic stress among healthcare workers during the COVID-19 pandemic: longitudinal changes and protective factors

6.1. Aim of the present study

Following the initial cross-sectional study, the second empirical study of the dissertation used a longitudinal approach to analyze changes in the mental health of healthcare workers during a later stage of the COVID-19 pandemic. The primary goal of the research was to explore changes in the levels of emotional exhaustion and secondary traumatization over time during the pandemic, with a particular focus on differences between frontline and non-frontline healthcare workers. The protracted nature of the pandemic and the persistent stress in the workplace necessitated an examination of how these psychological demands accumulate and intensify over time.

The study also paid particular attention to the role of positive psychological protective factors, primarily the concept of compassion satisfaction, which can mitigate the adverse effects of chronic and traumatic stress by providing satisfaction derived from helping others. The study also aimed to explore the extent to which emotional exhaustion contributes to the development of secondary traumatization and how these processes change during the different waves of the pandemic.
The study was exploratory, as longitudinal mental health data on the COVID-19 pandemic were limited at the time of the research, particularly for comparisons among healthcare professionals working in different work environments.

6.2. Hypothesis

Based on the aforementioned objectives, the study interpreted the development of emotional exhaustion and secondary traumatization within a theoretical framework that takes into account the cumulative effect of prolonged stress situations and the protective role of individual psychological resources. Based on previous empirical findings and theoretical models, it can be assumed that healthcare workers exposed to increased stress during the pandemic—especially those working on the front lines—will exhibit higher levels of emotional exhaustion and secondary traumatization, and that these indicators may intensify over time (Ruiz-Fernández et al., 2020; Wu et al., 2020).

According to numerous studies, emotional exhaustion can be considered a key indicator of resource impairment, which may contribute to further psychological vulnerability and thus to the development of secondary traumatization (İlhan & Küpeli, 2022). At the same time, compassion satisfaction—as a positive psychological resource—can act as a potential protective factor, mitigating the effects of both emotional exhaustion and traumatic stress (Stamm et al., 2010).

Based on these considerations, the hypotheses of the present longitudinal study were formulated, focusing on the development of emotional exhaustion and secondary traumatization in terms of level and time, and, on the other hand, examine the relationships between protective and risk factors, paying particular attention to the differences between frontline and non-frontline healthcare professionals.

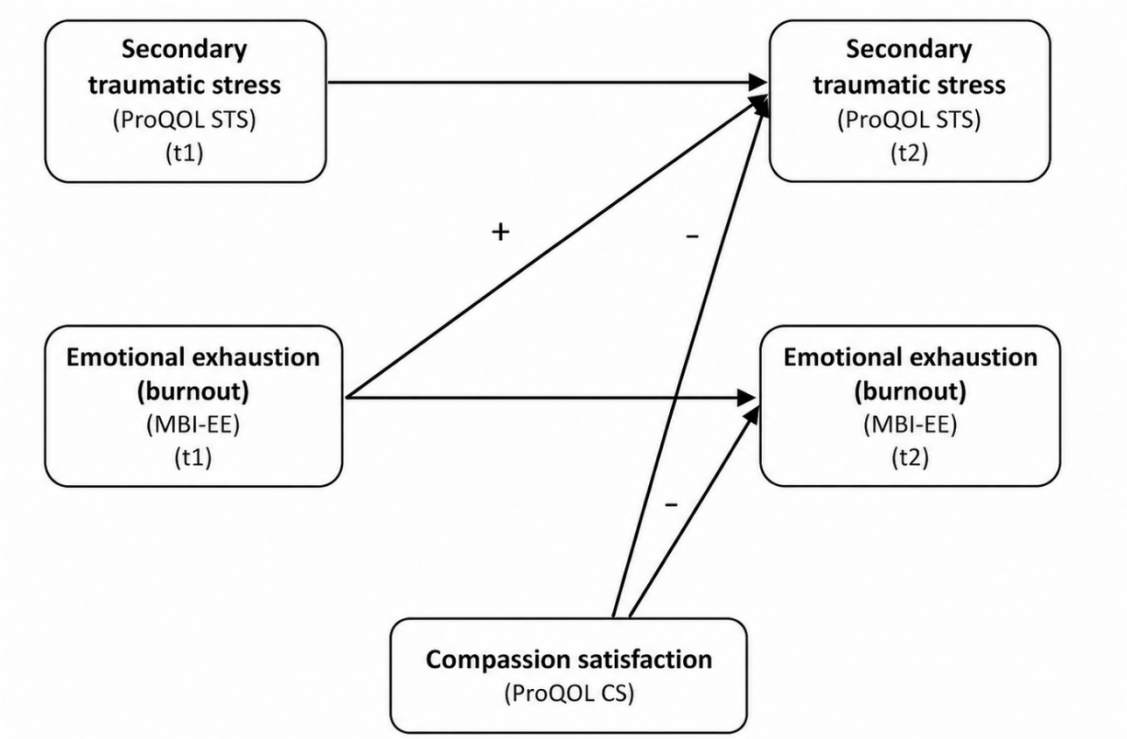
1. **H1:** Frontline healthcare workers will have higher levels of emotional exhaustion and secondary traumatization than non-frontline workers (Ruiz-Fernández et al., 2020; Wu et al., 2020).

2. **H2:** Levels of emotional exhaustion and secondary traumatization will increase over time among health workers during the COVID-19 epidemic (İlhan & Küpeli, 2022; Ruiz-Fernández et al., 2020).

3. **H3:** Compassion satisfaction will protect against emotional exhaustion and secondary traumatization (Stamm et al., 2010; İlhan & Küpeli, 2022).

4. **H4:** Higher levels of emotional exhaustion predict an increase in secondary traumatization, according to the assumptions of the COR model (Hobfoll, 1989; İlhan & Küpeli, 2022).

Figure 3. Hypothetical model of the relationships between emotional exhaustion, secondary traumatic stress and compassion satisfaction



Note. ProQOL STS = Professional Quality of Life Scale–Secondary Traumatic Stress subscale; MBI-EE = Maslach Burnout Inventory–Emotional Exhaustion subscale; ProQOL CS = Professional Quality of Life Scale–Compassion Satisfaction subscale. t1 = baseline measurement; t2 = follow-up measurement.

\+ = positive association – = negative association

6.3. Methods

The data collection took place between 14 January 2021 and 19 January 2022, when a total of 1 022 338 people in Hungary were confirmed to be infected with COVID-19 (Hungarian Central Statistical Office, 2017). During the study period, the average daily number of patients treated in hospital was 3 840 (SD = 3 564), according to coronavirus.gov.hu. The average number of people hospitalized during the study period was 395 per million (SD = 366), with a peak daily rate of 1 290 per million. In parallel, the number of available hospital beds was 4 271 per million inhabitants. These data suggest that the burden on the hospital care system exceeded 30% in the most severe period (Hungarian Central Statistical Office, 2017).

6.3.1. Procedure

The research was carried out with the permission of the Research Ethics Committee of the ELTE Eötvös Loránd University (2020/498). The data was collected through an online questionnaire, which was completed using the Qualtrics platform. A short information leaflet and a link to fill in the questionnaire were sent to the members of the Hungarian Medical Chamber (MOK) and the Hungarian Chamber of Health Care Professionals (MESZK). Participation was voluntary; respondents gave their written consent electronically at the beginning of the questionnaire and were free to withdraw from the survey at any time without giving any reason.

The first wave of data collection (T1) occurred between 14 January and 6 March 2021, during the second wave of the COVID-19 epidemic. The second data collection phase (T2) took place between 26 November 2021 and 19 January 2022, immediately before the fifth wave. Responses from the first and second waves were linked using pseudonyms to ensure anonymity and longitudinal traceability. To support mental well-being, participants had the opportunity to receive psychological support, which was provided by a collaborating health care provider.

6.3.2. Participants

The study involved active healthcare workers in Hungary. During the first data collection phase, 3321 questionnaires were completed. To be valid, respondents had to complete at least 90% of the questionnaire. This criterion was met by 2260 respondents. Of these, 340 agreed to participate in the second wave of the survey. 79.9% of the sample were women, and 20.1% were men. Age ranged from 20 to 87 years (mean age = 45.91 years; standard deviation = 13.48).

6.4. Measures

6.4.1. Secondary traumatization

Work-related stress was assessed using the Professional Quality of Life Scale (version 5) subscale measuring secondary traumatization (ProQOL STS), which was developed as a subcomponent of the Quality of Life of Support Workers (Stamm, 2010). The Hungarian version was validated by Kegye et al. (2018). The subscale includes ten statements rated on a five-point Likert scale (e.g., “I have difficulty separating my private life from my

helping role"), with responses ranging from 1 (never) to 5 (very often). The total score ranges from 10 to 50; Cronbach's alpha for internal reliability was .87 for the first measurement and .85 for the second.

6.4.2. Compassion satisfaction

In the second data collection phase, Compassion Satisfaction (CS) was measured using the ProQOL Compassion Satisfaction (ProQOL CS) subscale (Stamm, 2010) based on the Hungarian-validated version (Kegye et al., 2018). The subscale contains ten statements measuring satisfaction with the helping profession (e.g., "It gives me satisfaction to help others"), which were also rated by respondents on a five-point Likert scale (1 = never, 5 = very often). Possible scores range from 10 to 50; Cronbach's alpha was .92 at the second measurement.

6.4.3. Emotional exhaustion

Emotional exhaustion, one of the most important dimensions of burnout, was measured using the emotional exhaustion subscale of the Maslach Burnout Inventory Human Services Survey (MBI EE) (Maslach, Jackson, & Leiter, 1996), using the psychometrically validated version in Hungarian (Ádám & Mészáros, 2012). The original scale contains nine items that examine various work-related experiences of emotional exhaustion (e.g., "I feel emotionally exhausted because of my job") and was rated on a seven-point scale ranging from 0 (never) to 6 (daily). For the Hungarian version, item 14 was excluded from the subscale, so scores ranged from 0 to 48. The Cronbach's alpha value for the internal reliability of the scale was .94 in the first data collection and .95 in the second.

6.5. Statistical analysis

Descriptive statistical indicators (mean, standard deviation, skewness, peak) were calculated for all variables under study. A paired sample t-test was used to examine differences between time points T1 and T2. Variables can be considered approximately normally distributed if the values of skewness and kurtosis are within ±2 (Gravetter, Wallnau, Forzano, & Witnauer, 2020). In the present study, all variables ranged from -1.14 to +0.60. Cronbach's alpha values were calculated to estimate the reliability of the

psychometric scales. Correlations were determined using Pearson's correlation coefficient with a two-sided test. For all statistical analyses, the significance level was set at $p<0.05$. Descriptive statistics, reliability, and correlation analyses were performed using SPSS version 23.

Structural equation modeling (SEM) was performed using a cross-lagged panel model (CLPM) to answer the main research questions. Maximum likelihood estimation was chosen as the fitting procedure to be applied even with missing data, based on the control of normality conditions. We examined the predictive role of stability, reciprocity effects, and the predictive role of ProQOL STS and MBI EE, controlling for age. Model fit was assessed using different indicators: likelihood ratio tests (base model vs. test model, saturated model vs. test model), root mean square error of approximation (RMSEA), comparative fit index (CFI), Tucker-Lewis index (TLI), and global fit index (GFI). Literature recommendations indicate the goodness of fit: RMSEA<0.06; TLI and CFI >0.95; GFI >0.90 (McDonald & Ho, 2002), and χ^2/df value below 2 if the χ^2 test shows significant deviation from the saturated model (Kline, 2015).

The final model was selected based on the likelihood ratio test between the nested models. We then augmented the model with the variable ProQOL CS and conducted group disaggregated analyses for frontline and non-frontline health workers separately. In the final model, we also calculated standardized regression coefficients and explained variance (R^2) interpreted at the equation level. All calculations of the SEM models were performed using Stata 14 software.

6.6. Results

6.6.1. Descriptive statistics and preliminary analyses

For ProQoL STS and emotional exhaustion (EE), higher scores were found for frontline health professionals than for non-frontline health professionals (Table 1), thus supporting the first hypothesis (H1). There was a significant increase between the two measurement time points (T1 and T2) for both groups and effect sizes were of similar magnitude (Cohen's d: 0.30 and 0.23, respectively), confirming the validity of the second hypothesis (H2). Similar differences were also observed for MBI EE, with frontline workers reporting higher levels of attrition and showing partly similar changes over time

Table 6. Comparative descriptive statistics of the study variables in the first and second waves of the COVID-19 pandemic among all respondents and subgroups of frontline healthcare workers and non-frontline healthcare workers

		T1					T2					
Variables		N	M	SD	Skew.	Kurt.	N	M	SD	Skew.	Kurt.	Cohen-d
Secondary traumatic stress (ProQoL STS)	All	334	23.30_{a}	7.28	.25	-.55	301	25.35_{b}	7.52	0.33	-0.20	0.28
	Frontline	133	24.70_{aa}	6.66	-.07	-.32	96	26.90_{ab}	8.11	-0.09	0.05	0.30
	Non-frontline	184	22.70_{ba}	7.50	.47	-.40	148	24.32_{bb}	7.00	0.60	0.12	0.23
Emotional exhaustion (MBI EE)	All	336	24.61_{a}	12.84	-.08	-.94	301	27.68_{b}	13.84	-0.27	-1.12	0.23
	Frontline	134	28.13_{aa}	11.45	-.27	-.76	96	29.54_{aa}	13.11	-0.40	-0.90	0.11
	Non-frontline	185	22.82_{ba}	13.07	.05	-.90	148	25.84_{bb}	13.89	-0.15	-1.14	0.22
Compassion satisfaction (ProQoL CS)	All						300	35.40	7.27	-0.38	-0.34	
	Frontline						96	34.68_{a0}	7.65	-0.44	-0.40	
	Non-frontline						148	36.29_{a0}	7.32	-0.44	-0.20	

Note. The sum of the number of frontline and non-frontline workers is not equal to the number of all participants due to missing information about working place. Means for frontline and non-frontline groups in the same column not sharing the same first subscript were significantly different tested by two-sided independent sample *t*-test, while means for first and second waves in the same row not sharing the same second subscript are significantly different tested by two-sided paired sample *t*-test (in both cases at $p<.05$). Changes over time were only assessed in where there were full sample means. ProQol STS: Professional Quality of Life Scale, Secondary traumatic stress component of Compassion Fatigue subscale; ProQol CS: Professional Quality of Life Scale, Compassion Satisfaction subscale; MBI EE: Maslach Burnout Inventory for Human Service Survey, Emotional Exhaustion subscale; Skew= Skewness; Kurt=Kurtosis T1 = first measurement wave; T2 = second measurement wave.

Table 6 shows the Pearson correlations between the variables in the study. The statistical power test showed that a correlation value of 0.17 was already detectable in the population, with a Type II margin of error of 0.10. The results showed that most correlations were significant, except for the majority of the correlations related to occupation. The relationships between secondary traumatization, emotional exhaustion and job satisfaction were moderate to high strength and significant (.33 to .64), except for the relationship between the T1 time point for secondary traumatization and the T2 time point for job satisfaction, which was not found to be significant. The correlations between secondary traumatization and emotional exhaustion were positive, whereas a negative correlation was found between job satisfaction and both psychological burden indicators. Age showed a moderate-strength, significant relationship with all psychometric scales (.20 to .42 correlation values), while correlations with gender were weak or negligible (-.03 to .16). Frontline work showed weak but significant positive correlations with secondary traumatization and emotional exhaustion, but no detectable relationship with job satisfaction.

Table 7. Descriptive statistics and Pearson correlations for study variables

Variables	n	M	SD	1	2	3	4	5	6	7	8	9
1. Age	386	45.19	13.32	-								
2. Gender[a]	386	1.80	0.40	-.11*	-							
3. Occupation[b]	374	1.39	0.49	-.12*	.20**	-						
4. Frontline[c]	320	0.42	0.49	-.43**	-.08	.01	-					
5. Secondary traumatic stress, T1 (ProQoL STS)	334	23.30	7.28	-.21**	.14**	.04	.14*	-				
6. Emotional exhaustion, T1 (MBI EE)	336	24.61	12.84	-.42**	.11*	.05	.21**	.58**	-			
7. Secondary traumatic stress, T2 (ProQoL STS)	301	25.35	7.52	-.20**	.16**	.10	.17**	.53**	.45**	-		
8. Emotional exhaustion, T2 (MBI EE)	301	27.68	13.84	-.41**	.15**	.04	.13*	.39**	.64**	.56**	-	
9. Compassion satisfaction, T2 (ProQoL CS)	300	35.40	7.27	.29**	-.03	.02	-.11	-.19**	-.44**	-.33**	-.57**	-

Note.
[a] 1=male 2=female
[b] 1=doctors 2=other HCWs
[c] 0=not working in the frontline 1=working in the frontline
* $p<.05$, ** $p<.01$
ProQol STS: Professional Quality of Life Scale, Secondary traumatic stress component of Compassion Fatigue subscale; ProQol CS: Professional Quality of Life Scale, Compassion Satisfaction subscale; MBI EE: Maslach Burnout Inventory for Human Service Survey, Emotional Exhaustion subscale.

6.6.2. Cross-lagged panel models

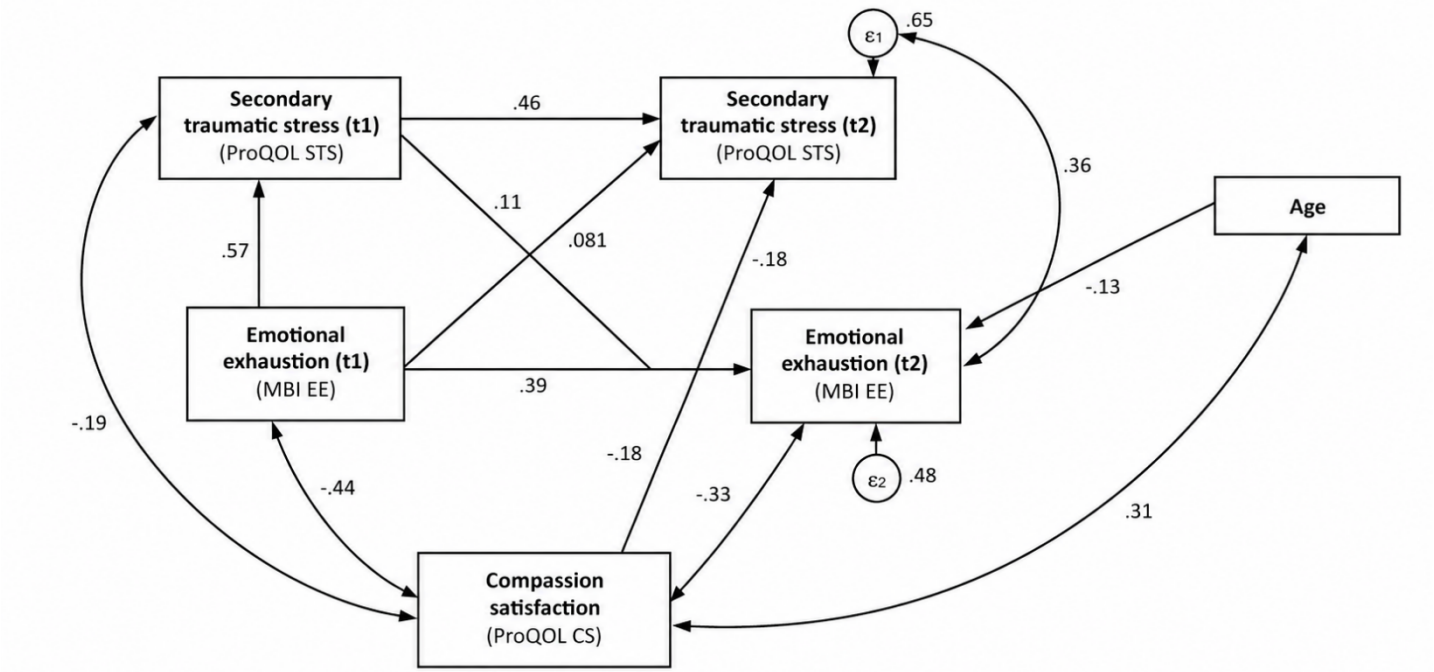
The maximum likelihood (ML) model fitting method was used for missing data, as all required criteria were met (see Table 8.). The stability model (m1) and the model with secondary trauma as a prior (m2) did not pass the χ^2 test. The likelihood ratio test (LR test) showed no significant improvement in model fit ($p = .064$). In contrast, the model with emotional exhaustion as an antecedent variable (m3) showed a significant improvement over the stability model ($p < .001$) and excellent fit on all fit indices. However, the reciprocal model (m4) did not yield further significant improvements ($p = .389$), so further analyses were based on this model. These results partially support the H4 hypothesis. The extension of the model with the co-satisfaction variable (m5) also showed a good fit based on all the indicators tested.

Table 8. Fit statistics for the structural equation models

Model (model number)	*n*	χ^2	*Df*	*p*	CFI	TLI	GFI	RMSEA	Model AIC	Model comparison	Δχ2(p)
Stability model (m1)	386	16.12	3	.001	.96	.90	.95	.106 (90% CI: .059, .160)	12074.2	-	-
Secondary traumatic stress as antecedent (m2)	386	12.69	2	.002	.97	.88	.96	.118 (90% CI: .062, .183)	12072.8	m1-m2	3.42 (.064)
Emotional exhaustion as antecedent (m3)	386	0.74	2	.689	1.00	1.00	.99	.000 (90% CI: .000, .075)	12060.8	m1-m3	15.37 (.000)
Reciprocity model (m4)	386	0.00	1	.965	1.00	1.00	.99	.000 (90% CI: .000, .000)	12062.1	m3-m4	0.74 (.389)
Emotional exhaustion as an antecedent with compassion satisfaction (m5)	386	2.42	2	.326	.99	.99	.99	.018 (90% CI: .000, .104)	13989.6	-	-
Emotional exhaustion as an antecedent with compassion satisfaction (frontline vs. non-frontline; m6)	320	5.15	4	.272	.99	.98	.98	.042 (90% CI: .000, .133)	11997.9	-	-
Reciprocity model with compassion satisfaction (m7)	320	0.137	1	.711	1.00	1.00	.99	.000 (90% CI: .000, .097)	13989.5	-	-
Reciprocity model with compassion satisfaction (frontline vs. non-frontline; m8)	320	0.273	2	.873	1.00	1.00	.99	.000 (90% CI: .000, .079)	11997.0	-	-

The multigroup model (m6) applied to frontline and non-frontline groups also showed a good fit. The frontline health workers model (m6) was found to be robust, as there was no significant relationship between emotional exhaustion (T1) and secondary traumatization (T2) ($p = .650$), nor between secondary traumatization (T1) and emotional exhaustion (T2) ($p = .074$). In the latter case, the non-significant result was probably due to the low number of items. In contrast, for non-frontline workers, a significant effect was found between emotional exhaustion (T1) and secondary traumatization (T2) ($p < .001$). Following these findings, a further analysis of the reciprocal model was conducted on the entire sample, including the variable of compassionate satisfaction (m7; see Figure 3.). Both this model and the newer multigroup model (m8) for frontline and non-frontline health workers were found to be adequate according to all fit indicators.

Figure 3. Reciprocity cross-lagged model (m7) between burnout and Secondary traumatic stress with the effect of compassion satisfaction among healthcare workers



Note. ProQOL is Professional Quality of Life Scale, ProQOL STS is Secondary Traumatic Stress element of the Compassion Fatigue subscale of ProQOL, ProQOL CS is Compassion Satisfaction subscale of ProQOL, MBI EE is Emotional Exhaustion subscale of the Maslach Burnout Inventory for Human Service Survey.

In the reciprocal model on the whole sample, which included the co-satisfaction variable, none of the cross-lag effects were significant (see Table 9.). However, compassionate satisfaction had a significant negative effect on both emotional exhaustion and secondary traumatization. In the multigroup analysis, among non-frontline health workers, secondary traumatization had a significant lagged effect on emotional exhaustion (.15; $p = .025$), whereas emotional exhaustion showed no significant lagged effect on secondary traumatization (-.03; $p = .710$).

In contrast, in the frontline group, emotional exhaustion showed a significant lagged effect on secondary traumatization (.29; $p = .004$), while there was no significant relationship in the opposite direction (-.01; $p = .845$). Compassion satisfaction had a negative and significant effect on both emotional exhaustion and secondary traumatization in both groups, but the effect was most substantial among frontline workers for emotional exhaustion (-.41; $p < .001$) compared with non-frontline workers (-.29; $p < .001$), and also for secondary traumatization (frontline: -.21; $p = .031$; non-frontline: -.15; $p = .045$). Our results thus supported hypothesis H3.

Table 9. Reciprocity cross-lagged model between burnout and secondary traumatic stress with the effect of compassion satisfaction among healthcare workers

		All HCWs (m7)			Frontline (m8)			Non-frontline (m8)		
		Std. Coef.	z	*p*>|z|	Std. Coef.	Z	*p*>|z|	Std. Coef.	z	*p*>|z|
Emotional exhaustion (T2)	Emotional exhaustion (t1)	.38	6.62	.000	.37	4.08	.000	.36	4.74	.000
	Secondary traumatic stress (T1)	.08	1.46	.145	-.01	-0.20	.845	.15	2.24	.025
	Compassion satisfaction	-.35	-7.96	.000	-.41	-5.29	.000	-.29	-4.79	.000
	Age	-.11	-2.66	.008	-.11	-1.55	.121	-.19	-3.10	.002
Secondary traumatic stress (T2)	Secondary traumatic stress (T1)	.43	7.45	.000	.25	2.57	.010	.57	7.90	.000
	Emotional exhaustion (T1)	.12	1.95	.052	.29	2.90	.004	-.03	-0.37	.710
	Compassion satisfaction	-.19	-3.46	.001	-.21	-2.16	.031	-.15	-2.01	.045

6.7. Discussion

This study investigated longitudinal changes in the mental health of healthcare workers in Hungary during the COVID-19 pandemic, focusing on the dynamics of emotional exhaustion (EE), secondary traumatization (STS), and compassion satisfaction (CS). Cross-lagged panel models were employed to examine the interrelationships among these factors and to identify differences between frontline and non-frontline workers.

The results indicate that both STS and EE levels were higher among frontline workers at both time points compared to non-frontline workers, consistent with previous research emphasizing the negative impact of working with infected individuals on mental health (Carmassi et al., 2020; Chirico et al., 2021; De Kock et al., 2021).

Emotional exhaustion and secondary traumatization increased over time during the COVID-19 pandemic, aligning with longitudinal findings indicating a progressive deterioration in healthcare workers' mental health (Sasaki et al., 2021). Compassion satisfaction served as a protective factor against both emotional exhaustion and secondary traumatization among frontline and non-frontline workers. This finding is consistent with prior evidence indicating that positive experiences with patients contribute to a more favorable balance between compassion satisfaction and compassion fatigue (Tremblay et al., 2011). Other studies have also highlighted the direct protective effect of CS against STS and compassion fatigue (Cummings et al., 2021).

Distinct causal patterns were identified between frontline and non-frontline workers: among frontline HCWs, higher levels of emotional exhaustion predicted increased secondary traumatization, whereas the reverse relationship was observed among non-frontline workers. These findings indicate a bidirectional association between emotional exhaustion and secondary traumatization, consistent with the assumptions of the COR model and confirming the possibility of circular causality, as proposed by Shoji et al. (2015). According to Vagni et al. (2020), a more familiar work environment and stable operating conditions among frontline workers may reduce the impact of EE on STS. The distinct causal relationships identified by the cross-lagged panel model further reinforce the interpretation of CS as a key protective factor.

This longitudinal study offers a comprehensive overview of the deteriorating mental health status of HCWs during the COVID-19 pandemic and highlights substantial

differences between professional groups in various clinical contexts. While frontline HCWs exhibited higher levels of both STS and EE at both time points, a significant increase in EE over time was observed only among non-frontline workers. One possible explanation for this pattern is the buffering effect of CS among frontline workers, which may mitigate the escalation of emotional exhaustion. Another explanation may involve the attenuation of the weak causal relationship between EE and CS.

These findings underscore the importance of addressing profession-specific vulnerability patterns when designing interventions. The results contribute to a more nuanced understanding of the diverse needs of HCWs in different fields and emphasize the necessity of tailored support strategies. This study also advances theoretical understanding of the protective role of coping strategies and the dynamic relationship between emotional exhaustion and secondary traumatic stress, offering important insights for future research and the development of effective interventions for healthcare professionals.

From a practical standpoint, these findings support the development of targeted positive psychological healthcare interventions and highlight the persistently poor mental health among HCWs, which has been further exacerbated by the COVID-19 pandemic. Further research is required to better understand the distinct experiences of burnout among frontline and non-frontline HCWs and to explore the complex relationship between emotional exhaustion and secondary traumatic stress in these groups. Such studies would advance knowledge in the field and provide valuable guidance for developing tailored prevention programs and support systems for healthcare professionals. As demonstrated in previous studies (Brooks et al., 2018) the greater resistance to emotional exhaustion observed among frontline HCWs and the significant protective effect of compassion satisfaction may play a central role in creating more differentiated prevention programs.

7. Project 3: Cynicism among medical students: an in-depth analysis of mental health dynamics and protective factors in medical education using structural equation modeling

7.1. Aim of the present study

The third empirical study of the dissertation examined the interrelationships among mental health challenges that arise in the early stages of medical training, with a particular focus on the development of empathy, perceived stress, and cynicism during professional socialization. As detailed in the introductory chapter, medical students are already exposed to significant psychological stress during their training, which can manifest itself in high stress levels, increased risk of burnout, decreased empathy, and increased cynical attitudes (Cuttilan et al., 2016; Dyrbye et al., 2005; Newton et al., 2008; Peng et al., 2018). These processes not only threaten students' current mental well-being but also have a long-term impact on the quality of future doctor-patient relationships and the effectiveness of healthcare (Pappa et al., 2020).

Based on the literature stress, cynicism, and empathy form a close, interactive system during medical socialization. Increased academic and emotional stress, as well as inadequate coping strategies, can contribute to the development of cynicism, which can be interpreted in part as a defense mechanism, but can also be accompanied by a decrease in empathy and an increase in the depersonalization component of burnout (Cuttilan et al., 2016; Jafari et al., 2012). At the same time, empathy—especially its cognitive dimension—has been shown in previous studies to act as a protective factor, reducing emotional exhaustion and depersonalization and promoting psychological well-being (Cairns et al., 2024; Chen et al., 2024).

The theoretical framework of the third study was based on the concepts of professional socialization and the hidden curriculum. Medical students acquire professional norms not only through formal education but also through role models observed during clinical practice, instructor attitudes, and institutional patterns. The hidden curriculum can convey both empathetic, patient-centered and cynical, emotionally distant patterns of behavior, which can have a significant impact on students' value systems, emotional involvement, and stress management (Batt-Rawden et al., 2013; Gaufberg et al., 2010; Hafferty et al., 2009).

Accordingly, one of the central objectives of the study was to explore the developmental patterns and interactions of empathy, stress, and cynicism in the early stages of medical training, i.e., before the actual start of the career. Another essential objective of the research was to examine the protective effect of patient-centered, empathetic medical role models—as positive elements of the hidden curriculum—on these psychological factors.

The third study thus contributes to the broader theoretical and practical question of what early intervention and prevention options are available to prevent burnout and protect the mental health of future physicians. The novel perspective of the research lies in the fact that it examines mental health risks not only after entering clinical work, but also in the early stages of professional identity formation, emphasizing the long-term significance of the educational environment and role models.

7.2. Hypotheses

In line with the research objectives, this study applied a theoretical model examining the interrelated development of empathy, perceived stress, and cynicism during medical professional socialization. The model is based on previous empirical findings suggesting that, over the course of training, increasing academic and emotional demands may lead to heightened stress levels, a gradual decline in empathy, and a strengthening of cynical attitudes associated with burnout.

These changes do not occur in isolation; they influence one another, contributing to the formation of students' professional attitudes and mental well-being (Cuttilan et al., 2016; Jafari et al., 2012). The model also considers the role of the hidden and implicit curriculum, with regard to the influence of observable medical role models. Based on social learning theory, it can be assumed that empathetic, patient-centered role models can act as a protective factor against the development of cynicism, while the broader, less operationalizable elements of institutional socialization may have a further indirect effect on the psychological factors examined (Batt-Rawden et al., 2013; Gaufberg et al., 2010; Hafferty et al., 2009).

The hypothetical model (Figure 4) illustrates this complex system of relationships, providing an opportunity to examine both time-related changes and the relationships between variables. The hypotheses of the present study were formulated based on this

conceptual framework. The first series of hypotheses concerns temporal changes in stress, empathy, and cynicism during training, while the second series examine the relationships among these factors, with regard to the potential moderating effects of empathy and role models. The model also assumes that the relationships examined are primarily structural characteristics of professional socialization and therefore appear regardless of the time of measurement. Accordingly, the study also analyzed the stability of the main findings across different waves of data collection, thereby reducing the uncertainty of interpretation due to possible external, time-varying effects.

Figure 4 presents a hypothetical model visualizing the interrelationship of these factors.

Along with the model, the following hypotheses were generated regarding the changes over time in various psychological variables:

- **H1**: Increased stress levels among medical students are expected as the years of study progress (Dyrbye et al., 2005; Frajerman et al., 2019; Peng et al., 2018).
- **H2**: Empathy levels show a gradual decrease over the course of education (Ferreira -Valente et al., 2017).
- **H3**: Medical students' cynicism levels will increase during the years of training (Hershey & Stoddard, 2021).

In addition, the research objectives included exploring the relationships between the factors. On this basis, the following additional hypotheses were formulated:

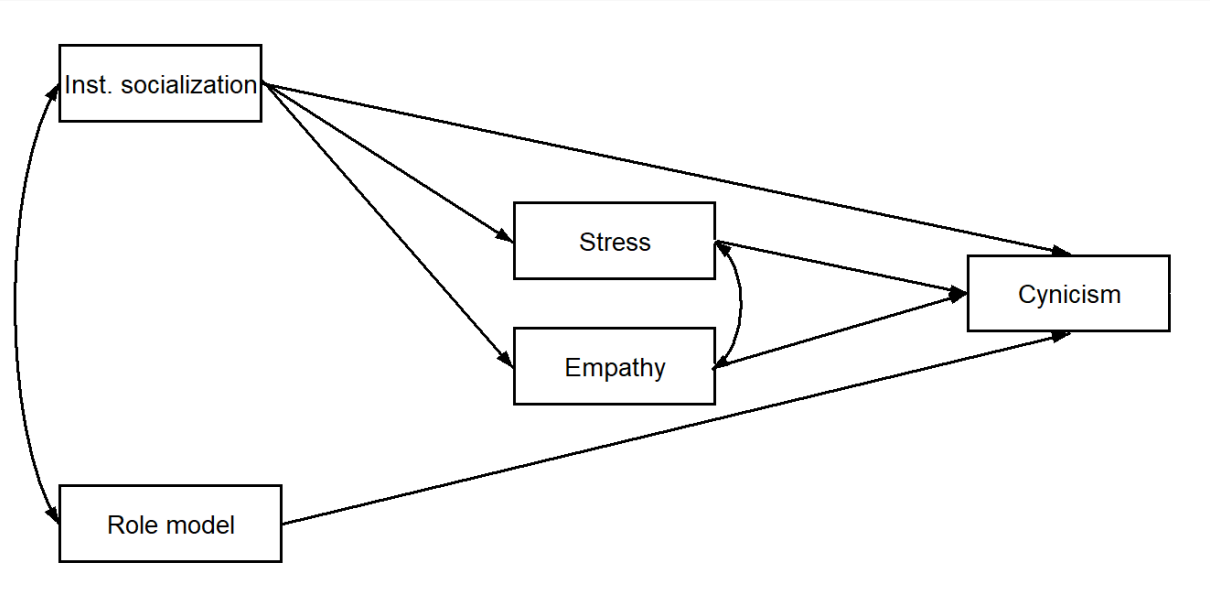
- **H4**: Empathy and the presence of a role model reduce cynicism among medical students (Bandura, 1977; Dyrbye et al., 2005; Passi & Johnson, 2016; Peng et al., 2018).
- **H5**: Higher stress levels are associated with higher levels of cynicism among medical students (Dyrbye et al., 2005; Peng et al., 2018).

The model was also extended to examine the impact of institutional socialization as part of the hidden curriculum, compared to the role model's measurable influence. We also examined the independence of the hypotheses (H1-H4) from time (**H6**), i.e., the stability of the results across different waves of data collection. The inclusion of the time of data

collection also provides an opportunity to exclude external environmental effects from the interpretation.

These hypotheses provide a structured framework for exploring how psychological factors change and are interrelated throughout medical training.

Figure 4. Hypothetical model of relationship between (length of) institutional socialization, role model, stress, empathy and burnout.



7.3. Methods

7.3.1. Procedure

The research was conducted in accordance with the ethical guidelines of the American Psychological Association (APA) and was approved by the Research Ethics Committee of the Faculty of Education and Psychology of Eötvös Loránd University (2018/168). In all cases, participants gave written, voluntary, and informed consent to participate, which they could withdraw at any time. The questionnaire was pre-tested by a small group of medical students, who helped to fine-tune the final version.

The first data collection of the survey took place in the autumn of 2018 when students completed the questionnaire in paper-certificate form during curriculum-related sessions (data collection took place between 01.09.2018 and 07.12.2018). The second data collection phase occurred during the COVID-19 epidemic when students were typically not on campus, so data collection was exclusively online (between 13.11.2020 and 28.06.2021). Students were asked to complete the questionnaire during or immediately after their online courses, which was in line with their curriculum. This different context and format may partly explain the second survey's lower response rate than the first.

7.3.2. Participants

The study was carried out among third and fifth-year students of the Faculty of General Medicine of the University of Pécs in a repeated cross-sectional study. During the first five semesters of the six-year medical training, students acquire the most important aspects of doctor-patient relations in behavioral science courses. These include medical anthropology, medical sociology, medical psychology, and medical communication. In addition, students may voluntarily participate in Balint group sessions, seek psychological counseling, and participate in peer support programs.

Data was collected at two measurement points, allowing for cross-sectional and longitudinal data analysis. The first data collection occurred in the first semester of the 2018/2019 school year (T1), while the second one took place approximately two and a half years later, in the second semester of the 2020/2021 school year (T2). The target population was selected from the third and fifth-year classes, as they have already completed the behavioral science courses and are regularly involved in clinical training. Students in the final year were not included for technical reasons, as they were not in regular practicums and would have made the measurement impractical.

In the first wave (2018/2019), a total of 251 students participated: 124 third-year students (47.6% male, 52.4% female, average age 22.1 years) and 127 fifth-year students (34.6% male, 65.4% female, average age 24.0 years). In the second wave (2020/2021), 119 students responded to the questionnaire, of which 82 were third year and 37 were fifth-year students. It is important to note that the fifth-year cohort in the second wave was the same as the third-year cohort measured in the first wave, allowing for longitudinal follow-up. Although participation was anonymous, respondents generated unique self-identification codes that enabled the matching of questionnaires across measurement waves while preserving anonymity.

7.4. Measurers

Researcher-developed measurement instruments were used to assess some elements of the theoretical model in this study, such as the presence of a positive role model and experiences of institutional socialization. Standardized and validated psychometric scales were used to measure the other constructs. Stress levels were measured using the Perceived Stress Scale (PSS) and the Interpersonal Reactivity Index (IRI) "Personal Distress" subscale. Empathy was measured using the "Empathic Concern" subscale of the same questionnaire. Cynicism was measured using the "Cynicism" subscale of the student version of the Maslach Burnout Inventory (MBI).

7.4.1. Role model

The role model's impact was assessed using a self-developed questionnaire aimed at assessing the patient-centered doctor-patient relationship, which was used as a proxy variable. The question was based on Stewart and Roter's (1989) model of an ideal doctor-patient relationship based on reciprocity. In the survey, students were asked to rate the extent to which the behavior of their preferred instructor reflected the two main characteristics of a patient-centered approach: partnership and information sharing. We assumed that these factors were present together in most cases. They were asked to assess the following statement: "Instructors treat patients as partners and share all relevant information about their treatment." The rating was on a seven-point scale, where 1 meant "not at all characteristic" and 7 meant "absolutely characteristic" (Stewart & Roter, 1989).

7.4.2. Institutional socialization (complex effects of medical training)

The extent of institutional socialization was represented by the number of years of medical training —i.e., the year in which the student was studying at the time of data collection. This variable includes any hidden effects that were not measured directly but may have affected students during their medical training.

7.4.3. Stress and distress

Two different psychometric instruments were used to measure stress: the Perceived Stress Scale (PSS) and the "Personal Distress" subscale of Interpersonal Reactivity Index (IRI-PD). The assessment of stress levels was one of the main objectives of the study. The use

of two different measures was expected to increase the validity and reliability of the results, as they capture different aspects of stress. While the PSS focuses more on general and internal experience, the IRI-PD measures stress related to interpersonal tensions.

The Perceived Stress Scale (PSS), a 14-item instrument (Cohen, 1988; Stauder & Konkolÿ Thege, 2006), was used to assess perceived stress. The questionnaire contains seven positive and seven negative statements. Respondents rated on a five-point scale how often they had experienced particular feelings in the past month (0 = never, 4 = very often). Positive statements were scored using a reverse scoring system. The total scale score ranged from 0 to 56, with a Cronbach's alpha of .88.

To measure personal distress, the IRI "Personal Distress" subscale (Davis, 1983; Kulcsár, 2002) was used. The IRI consists of four separate subscales: Perspective Taking (IRI-PT), Fantasy (IRI-FS), Empathic Concern (IRI-EC), and Personal Distress (IRI-PD). Each subscale consists of seven items, including both negative and positive statements. Responses were given on a five-point scale (0 = "not at all characteristic of me", 4 = "completely characteristic of me"), with positive statements scored in reverse here. The subscales' confidence intervals (Cronbach's alpha) were .73, .79, .70, and .74, respectively.

7.4.4. Empathy

Empathy was assessed using the *Empathic Concern* (EC) subscale of the Interpersonal Reactivity Index (IRI), which captures the tendency to experience feelings of compassion, care, and concern for others in emotionally evocative interpersonal situations (Davis, 1983). Empathy represents a key psychological construct in the present study, as it is assumed to play a protective role in relation to stress-related outcomes and burnout-related processes.

The IRI is a widely used multidimensional self-report instrument designed to assess dispositional empathy across four distinct domains: *Perspective Taking* (IRI-PT), *Fantasy* (IRI-FS), *Empathic Concern* (IRI-EC), and *Personal Distress* (IRI-PD). In line with the theoretical focus of the present research, the Empathic Concern subscale was selected, as it reflects other-oriented, affective components of empathy rather than self-focused emotional distress.

The Empathic Concern subscale consists of seven items assessing emotional responsiveness to others' experiences of need or suffering. Responses were given on a five-point Likert scale ranging from 0 ("not at all characteristic of me") to 4 ("completely characteristic of me"). The total EC score was calculated by summing item responses, with higher scores indicating greater levels of empathic concern. In the present sample, the internal consistency of the EC subscale was acceptable (Cronbach's alpha = .70).

The use of the Empathic Concern subscale allowed for the examination of empathy as a relatively stable individual difference variable, distinct from stress-related emotional reactivity, and enabled a more precise differentiation between adaptive empathic engagement and maladaptive personal distress within the analytical model.

7.4.5. Cynicism

Cynicism was measured using the "Cynicism" subscale of the Maslach Burnout Questionnaire (MBI) adapted for students (Schaufeli et al., 2002a; Schaufeli et al., 2002b; Hazag et al., 2010). This instrument assesses different aspects of burnout through three subscales: Emotional Exhaustion (MBI-EE; 5 items), Cynicism (MBI-CY; 4 items), and Professional Efficacy (MBI-PE; 6 items). For example, respondents rated statements such as "I doubt the importance of my studies" on a seven-point scale, where 0 means "never" and 6 means "always". The score range for each subscale was, in order, 0-30 (EE), 0-24 (CY), and 0-36 (PE). The reliability of the subscales was confirmed by the following Cronbach's alpha values: .84, .85, and .83.

7.4.6. The effect of time

The time of data collection was used as a control variable in the statistical analyses to exclude possible time effects.

7.5. Statistical analysis

Descriptive statistics (means, standard deviations) were calculated for all variables in the survey. A paired t-test with Sidak's correction was used to examine differences between year groups and time points. Variables were considered to have a near-normal distribution if the values of asymmetry and peakiness were within ±2 (Wallnau, 2002). In the sample, asymmetrical values ranged from -0.41 to +0.44, while peakiness ranged from -0.85 to

+0.21. The reliability of the psychometric scales was estimated using Cronbach's alpha values. Pearson correlation coefficients calculated with a two-sided test were used for correlation analysis. The significance level of $p < .05$ was used for all statistical tests. The strength of correlations was assessed using Cohen's (1988) categories. Descriptive statistical, reliability, and correlation analyses of the data were performed using SPSS version 23.

Hypotheses were tested using structural equation modeling (SEM). The estimation method was chosen based on the normality of the variables. Paths that were not found to be significant ($p > .05$) were removed from the model. The quality of the model fit was assessed using various indicators: likelihood ratio test (compared to baseline model and saturated model), RMSEA (root mean square error), CFI (comparative fit index), TLI (Tucker-Lewis index), and GFI (goodness of fit index). The model was considered to have a "good" fit if the RMSEA was less than .05 and acceptable if it was below .08. For the CFI, TLI, and GFI, the acceptable threshold is >0.90 (McDonald & Ho, 2002). In the final model, we calculated the standardized and non-standardized path coefficients, the total effect (as the sum of direct and indirect paths), and the equation-level explained variance (R^2).

7.6. Results

7.6.1. Descriptive statistics and preliminary analyses

Table 10 shows the descriptive statistical indicators of the variables under study and their differences by the length of institutional socialization and date of data collection. In the 2018/2019 data collection period, perceptions of patient-centered physician role models were significantly lower among fifth-year students than third-year students. However, this difference was not observed in the 2020/2021 measurement nor in the cohort following the same cohort between the two dates.

No significant difference was found between the perceived stress levels of third—and fifth-year students in any given year or between subsequent cohorts. This result did not support hypothesis H1. However, third-year students in the 2020/2021 cohort reported significantly higher stress levels than third—and fifth-year students in the 2018/2019 cohort.

Table 10. Changes in descriptive statistics of the study variables over time and between year classes

	2018/2019						2020/2021						Total				
	Third-year			Fifth-year			Third-year			Fifth-year							
Variables	n	M	SD	N	M	SD	n	M	SD	n	M	SD	n	M	SD	Skewness	Kurtosis
1. Patient-centered Role Model perception	121	4.93_{a}	1.32	126	4.44_{b}	1.49	79	4.95_{ab}	1.22	37	4.73_{ab}	1.02	363	4.74	1.35	-.14	-.33
2. PSS	122	27.32_{a}	8.65	126	26.33_{a}	8.00	73	31.11_{b}	8.99	34	29.97_{ab}	9.96	355	28.00	8.80	.19	-.12
3. IRI- Perspective taking	124	18.06_{ab}	4.62	125	17.12_{a}	4.33	79	19.25_{b}	4.88	36	18.33_{ab}	4.86	124	18.02	4.65	-.20	-.45
4. IRI- Fantasy	124	17.82_{ab}	5.37	126	16.89_{a}	5.79	79	19.54_{b}	5.41	36	17.69_{ab}	5.92	124	17.86	5.65	-.31	-.32
5. IRI- Personal distress	124	11.97_{a}	4.78	127	11.04_{a}	4.92	79	11.49_{a}	5.59	35	11.14_{a}	6.46	365	11.46	5.18	-22	-.33
6. IRI- Empathic concern	123	17.43_{a}	5.3	125	17.86_{a}	4.10	79	18.85_{a}	4.54	35	17.77_{a}	5.31	362	17.92	4.75	-.18	-.24
7. MBI- Emotional exhaustion	118	14.19_{a}	7.04	114	15.12_{ab}	7.08	80	17.35_{b}	7.68	37	17.86_{bc}	7.39	118	15.61	7.34	.07	-.70
8. MBI- Cynicism	118	7.16_{a}	6.12	115	9.52_{b}	6.72	80	9.33_{ab}	6.24	37	12.57_{b}	6.74	350	9.00	6.59	.44	-.85
9. MBI- Professional efficacy	117	24.03_{a}	6.62	115	25.07_{a}	6.27	80	23.19_{a}	6.75	37	23.11_{a}	6.70	117	24.08	6.57	-.41	.21

Notes: Means for different timepoint and different class in the same row not sharing the same subscript are significantly different at $p<.05$ in the two-sided test of equality for column means. Cells with no subscript are not included in the test. Tests assume equal variances. PSS = Perceived Stress Scale; IRI = Interpersonal Reactivity Index; MBI = Maslach Burnout Inventory

Different aspects of empathy also showed similar patterns over time and in relation to the length of institutional socialization. There was no significant difference in scores between cohorts at the same time or at different times in the same cohort. The only significant difference between scores on the IRI-PT and IRI-FS scales was between fifth-year students in the 2018/2019 school year and third-year students in the 2020/2021 school year. These results did not support hypothesis H2.

There was more significant heterogeneity in the dimensions of burnout. For MBI-PE, no differences were found regarding time or length of institutional socialization. In contrast, MBI-EE scores were significantly higher among third-year students in the 2020/2021 academic year than among third-year students in the 2018/2019 academic year; no other significant differences were identified. For cynicism, fifth-year students' scores were significantly higher than third-year students in the 2018/2019 measurement, and we also found an increase in the subsequent cohort between 2018/2019 and 2020/2021. This result supports hypothesis H3.

Table 2 shows the Pearson correlations between the variables under study. Patient-centered role modeling showed (1) a weak to moderate positive correlation with the IRI-PT and MBI-PE scales and (2) a weak but significant negative correlation with the MBI-EE and MBI-CY scales. This latter correlation supports hypothesis H5.

Table 11. Pearson correlations for study variables

Variables	n	1	2	3	4	5	6	7	8	9
1. Patient-centered Role Model perception	363	-								
2. PSS- Perceived Stress Scale	355	-,10	-							
3. IRI- Perspective taking	364	.13*	.00	-						
4. IRI- Fantasy	365	.00	.21**	.27**	-					
5. IRI- Personal distress	365	.00	.47**	-.06	.09	-				
6. IRI- Empathic concern	362	.05	.14**	.39**	.41**	.17**	-			
7. MBI- Emotional exhaustion	349	-.11*	.59**	.00	.07	.32**	.07	-		
8. MBI- Cynicism	350	-.18**	.36**	-.06	-.03	.23**	-.15**	.64**	-	
9. MBI- Professional efficacy	349	.20**	-.42**	.13*	.04	-.32**	.19**	-.39**	-.49**	-

Notes: *p<.05, **p<.01. IRI = Interpersonal Reactivity Index; MBI = Maslach Burnout Inventory

Perceived stress showed a moderate to strong significant correlation with different subscales of empathy and burnout, except for the IRI-PT dimension, which was unrelated to the PSS. The PSS showed a negative relationship with the MBI-PE subscale. These results supported hypothesis H5. Furthermore, primarily significant positive correlations of moderate strength were observed between the different dimensions of empathy, except for the relationships between the IRI-PT, IRI-FS, and IRI-PD subscales, for which no such correlations were observed. Among the burnout subscales, there were strong or almost strong positive correlations between MBI-EE and MBI-CY, while there were negative correlations between MBI-EE, MBI-CY, and MBI-PE. Of the dimensions of empathy, only the IRI-PD and IRI-EC showed significant relationships with some aspects of burnout, typically with weak to medium strength correlations. The relationships between IRI-EC and MBI-CY and between IRI-PD and MBI-EE were negative, while other significant empathy-burnout correlations were positive.

Based on the above, it was decided to exclude the MBI-PE and MBI-EE subscales from the model, as no significant differences in these variables were detected either over time or between years. IRI-FS and IRI-EC were also excluded for similar reasons, as they did not show significant relationships with either burnout or role model perception, nor were there significant differences in these subscales over time or across years.

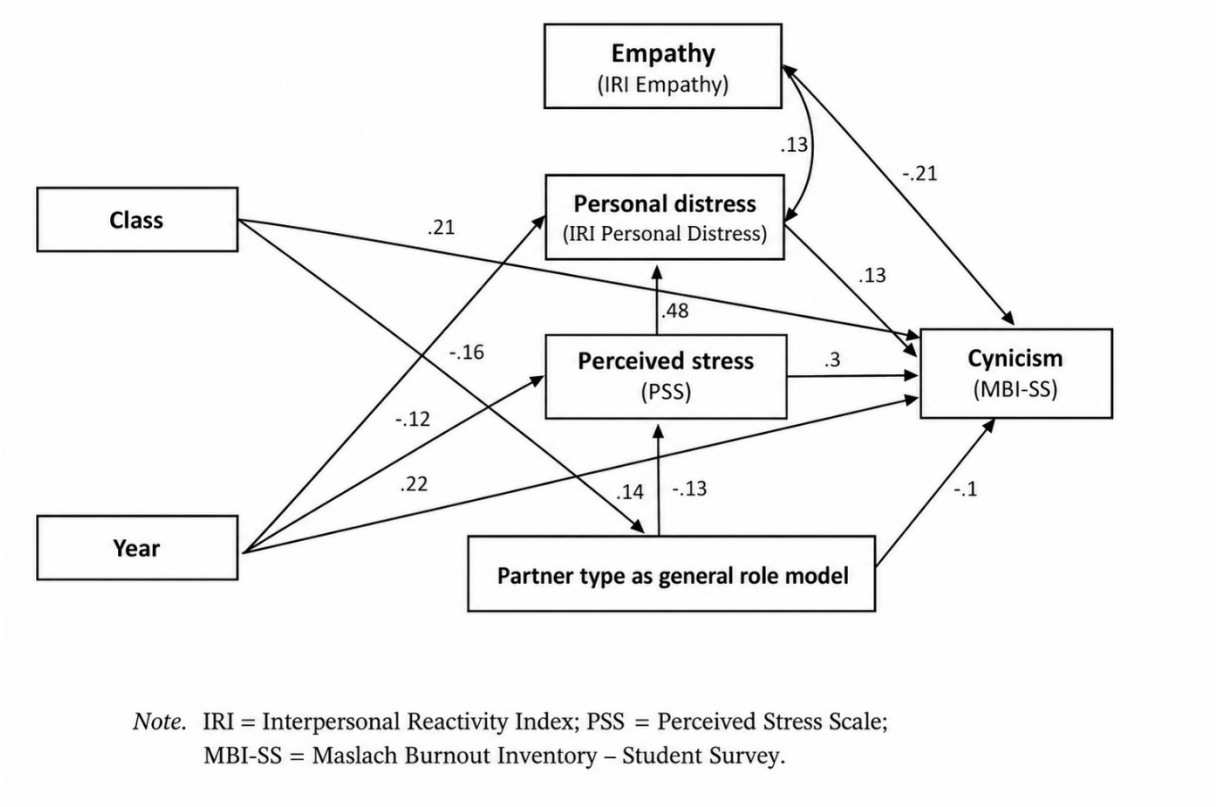
7.6.2. Structural equation model

A maximum likelihood model was used to fit the model even in the case of missing data, as all the necessary criteria were met. The original model did not fit the data well: χ^2=14.33 (df=4), p=.006; CFI=.95; TLI=.77; GFI=.94; RMSEA=.084 (90% CI: .040-.132), AIC=11865.8. The model, adjusted to account for the modification indices and removing non-significant paths, now fitted the data well: χ^2=15.12 (df=8), p=.057; CFI=.97; TLI=.92; GFI=.94; RMSEA=.049 (90% CI: .000-.087), AIC=11848.6.

Based on the final version of the structural equation model (Figure 4), the length of medical training (year of training) had a weak positive direct effect on cynicism and a weak negative effect on the perception of the partner-based physician-patient relationship role model. The date of data collection had a weak to moderate effect on perceived stress, a mild negative effect on personal distress, and a weak positive effect on cynicism. Perception of the partner-oriented role model had a weak negative effect on both

perceived stress and cynicism. Perceived stress had a moderate to strong positive effect on cynicism and personal distress. Personal distress independently had a weak positive effect on cynicism. Empathic concern had a weak to medium reduction in cynicism and a weak positive effect on personal distress.

Figure 5. Final structural equation model showing associations between perceptions of a role model, length of training, time of data collection, perceived distress, empathic concern, and cynicism



Note. IRI = Interpersonal Reactivity Index; PSS = Perceived Stress Scale; MBI-SS = Maslach Burnout Inventory – Student Survey.

When the overall effects of each of the variables examined were assessed (Table 12), it was found that for cynicism, perceived stress showed a moderate to strong positive effect, while personal distress had a weaker but independent positive effect. This supported hypothesis H5. However, perceptions of partner-based role modeling and empathic caring had weak to moderate reducing effects on cynicism, thus supporting hypothesis H4. The duration of medical training and the time of data collection also had weak to medium positive overall effects on cynicism. The effect of the duration of medical training supported H3, while the separate effect of the time of data collection did not support hypothesis H6.

Table 12. Overall effects of length of medical training, date of data collection, and patient-centered role modeling on stress, empathic caring, and cynicism

		Std. Coeff.	z	*p*>|z|
Cynicism	Perceived stress	.36	6.66	.000
	Personal distress	.13	2.49	.013
	Empathic concern	-.21	-4.42	.000
	Patient centered role model	-.16	-2.99	.003
	Class	.20	3.80	.000
	Year	.17	3.31	.001
Personal distress	Perceived stress	.49	10.21	.000
	Patient centered role model	-.07	-2.76	.006
	Class	-.08	-1.41	.158
	Year	-.02	-0.44	.663
Perceived stress	Patient centered role model	-.14	-2.76	.006
	Class	.07	-1.25	.211
	Year	.20	3.68	.000
Patient centered role model	Class	-.16	-2.97	.003
	Year	.04	0.70	.487

Empathy did not show a relationship with either length of medical training or time of data collection, therefore this result did not support hypothesis H3. However, in the case of personal distress, we observed a strong positive overall effect of perceived distress. Neither the time spent in medical training, nor the time point of data collection had a significant effect on personal distress. For perceived stress, the perceived presence of a patient-centered doctor-patient model had a weak negative overall effect, while the point in time of data collection showed no statistically significant effect. However, time in medical training had a weak but positive directional effect that supported hypothesis H2. Perception of the patient-centered model significantly, but only very slightly, reduced personal distress, with perceived distress as the mediating variable of effect. Furthermore, the number of years in medical training had a weak but significant adverse effect on the perceived presence of the patient-centered model.

7.7. Discussion

The aim of the present study was to investigate dynamic changes in empathy, stress, and cynicism among medical students, considering the effects of institutional socialization and patient-centered role models. The results confirmed hypothesis H_3, namely that cynicism increases significantly during medical training. This finding is consistent with previous research suggesting that students in a hierarchical health care system are at increased risk regarding their mental health due to the vulnerability they experience during their practice (Brazeau et al., 2010).

Although the perception of patient-centered role models slightly decreased as the study progressed, the model showed a moderate protective role in reducing cynicism (H_4). In addition, empathy demonstrated a significant negative relationship with cynicism levels, also confirming hypothesis H_4. These results emphasize the importance of positive role models and empathic attitudes in training.

However, hypotheses H_1 and H_2 were not confirmed: our data did not detect an increase in stress or a decrease in empathy. This is in line with the scoping review of Ferreira-Valente et al. (2017), which reviewed longitudinal studies among medical students and healthcare professionals with follow-up periods ranging from months to several years, and concluded that changes in empathy over time show no consistent overall pattern. A

similar situation applies to the evolution of stress levels (Salam et al., 2013), although most studies confirm that medical students' stress levels are higher than those of the general population (Heinen et al., 2017).

In the structural equation model, personal distress and perceived stress had a significant positive effect on cynicism, while empathic concern had a weak to medium reduction in cynicism and a weak positive effect on personal distress, supporting hypothesis H_6. These findings are in line with the results of Jafari et al. (2012) and Cuttilan et al. (2016), who found that stress experienced during training plays an important role in the development of negative attitudes.

Overall, the results of this study underline the impact of medical training on empathy and different aspects of burnout, with a particular focus on cynicism. As training progresses, cynicism levels increase significantly, which may compromise the quality of the doctor–patient relationship and patient health outcomes in the long term. The findings highlight the protective role of empathy and patient-centered medical role models against the development of cynicism—especially in educational contexts where training focuses heavily on technical skills and biomedical knowledge at the expense of humanistic approaches. The observed increase in cynicism is also likely linked to students' gradual disillusionment with the ideal of the medical role.

Taken together, these results underscore the importance of strengthening the human aspects of medical education and developing support systems that help students manage emotional stress, prevent burnout, and improve the doctor–patient relationship. International examples further demonstrate that well-designed educational interventions can increase students' empathy and reduce stress under appropriate environmental conditions (Zgheib et al., 2020). The present study's findings may thus provide useful guidance for curriculum development, the design of student support programs, and the planning of further research.

8. General discussion

8.1. Introduction

The literature review and the three empirical studies presented in this doctoral dissertation focus on the mental health of healthcare workers, a population particularly vulnerable to psychological strain due to their exposure to both chronic and acute stressors. As discussed in the introduction, the healthcare profession inherently involves emotionally demanding situations, which place HCWs at elevated risk for stress-related psychological difficulties (Healy & McKay, 2000; Ito et al., 2014; Laranjeira, 2012).

Two of the studies investigated the mental health of HCWs during the COVID-19 pandemic—an unprecedented global crisis that served as a natural stress test for the healthcare system. These studies examined both individual and institutional background factors that contribute to stress, burnout, and depression, employing cross-sectional and longitudinal methods, as well as structural equation modeling (SEM) to identify psychological mechanisms and mediating effects.

The results of the first two studies highlight the significant psychological burden experienced by HCWs, particularly in times of crisis such as a pandemic. Our findings also allow for comparison between subgroups, revealing differences in vulnerability across professional roles and institutional positions. Through statistical modeling, we identified both individual and organizational factors that negatively affect mental well-being, reduce resilience, or increase vulnerability to stress. Importantly, the studies illuminate how psychological symptoms are interrelated—how stress can lead to burnout, depression, or even physical health deterioration through well-established psychophysiological pathways.

In addition to identifying risk factors, our research also identified several potential protective factors that may buffer the adverse psychological effects of prolonged healthcare crises. Compassion satisfaction, greater perceived control, predictability of working conditions, and supportive organizational and psychological resources appeared to contribute to resilience and more adaptive psychological coping among healthcare workers (Spányik et al., 2022, 2023). These findings have important implications for the planning of targeted preventive interventions and organizational mental health strategies in healthcare settings.

The third study broadens the scope by addressing the role of early prevention in the context of medical career socialization. Using a semi-longitudinal design, this study examines how socialization processes during medical training impact the mental health of medical students. This phase is formative not only in terms of professional identity development but also in shaping long-term coping strategies and attitudes toward patient care. However, it is also a period of heightened vulnerability, making students a key target group for early intervention efforts. As discussed in the introduction, fostering psychological well-being at this stage has downstream implications not only for individual resilience but also for the future quality of doctor-patient relationships (Pappa et al., 2020; McKerrow et al., 2020; Santen et al., 2010).

Overall, the insights gained from these studies provide practical guidance for healthcare institutions, policymakers, and educational leaders. They underscore the need to address psychological risks at both systemic and individual levels and to invest in strategies that promote mental health throughout the medical career trajectory—from training to frontline clinical work.

This general discussion aims to interpret the results of the three studies within a broader conceptual and empirical context. It outlines the theoretical and practical implications of the findings, reflects on the limitations of the research and methodology, and offers directions for future inquiry.

8.2. Mental health consequences of pandemics for Healthcare Workers

The first two studies of the dissertation clearly showed that pandemics, especially COVID-19, place a significant psychological burden on healthcare workers. Based on structural equation modeling (SEM), it was found that the development of stress, burnout, and depression is not directly mediated by objective external factors (such as frontline work or institutional transfer) but rather by their subjective interpretation. One of the strengths of the first study is that it involved a large sample size, which allowed for a reliable estimation of the structural model and an examination of the effects of various background variables.

The results show that both general perceived stress and work-related stress significantly increased burnout and were directly and indirectly associated with depression. These

results are consistent with previous studies (e.g., Embriaco et al., 2007; Imo, 2017; Tokuda et al., 2009), which also emphasized the central role of subjective stress experiences in the development of mental symptoms.

Interestingly, there were no differences between physician and non-physician healthcare workers in the mediating processes of stress, burnout, and depression. However, non-physician workers reported higher levels of uncertainty, greater stress, and higher levels of depression despite no significant differences in the degree of burnout. This difference can be interpreted based on the mediation model: the differences did not appear at the level of the mediating variables but only at the level of the outcome variable (depression).

The second study examined longitudinal patterns in the dynamics of burnout (emotional exhaustion, EE), secondary traumatization (STS), and compassion satisfaction (CS). One of the study's important values is its longitudinal design, which enabled a deeper understanding of temporal changes and causal relationships in mental health.

The results showed that frontline workers had higher levels of STS and EE, which continued to increase over time. The mentioned findings support international literature, which indicates that a gradual deterioration in mental health can be observed among healthcare workers during the pandemic (e.g., Sasaki et al., 2021).

It is particularly noteworthy that CS, i.e., satisfaction derived from helping others and from the positive subjective experience of caregiving work, acts as a protective factor against secondary traumatization and emotional exhaustion. This finding suggests that positive professional experiences and emotionally rewarding aspects of patient care may play an important role in mitigating psychological stress among healthcare workers.

Another important finding was that we observed different causal relationships between frontline and non-frontline workers: while EE increased subsequent STS levels among frontline workers, the opposite was true for non-frontline workers. This result confirms the possibility of circular causality (Shoji et al., 2015) and highlights that workplace stability and predictability may be moderating factors in stress dynamics (Vagni et al., 2020).

Overall, the results of the two studies show that the pandemic places a significant psychological burden on healthcare workers, especially those working on the front lines,

and that subjective factors (perceived stress, uncertainty, empathic experience) play a fundamental role in the development of psychological outcomes.

8.3. Protective factors during crises: Resilience and psychological resources

The results of the first two empirical studies not only highlighted the adverse effects of COVID-19-related stressors on the mental health of healthcare workers but also emphasized the fundamental role of protective factors in mitigating these effects. Identifying and strengthening such factors is particularly important in crises, as they can mitigate the effects of acute and chronic stress, reduce the risk of burnout and depression, and promote psychological adaptation. The results presented in the dissertation highlight two particularly relevant areas of protection: (1) a sense of security and control in the workplace, and (2) the role of positive psychological resources, such as compassion satisfaction (CS).

The first study showed that the subjective perception of pandemic-related stressors played a greater role in explaining burnout and depression than objective factors. While frontline assignments or temporary relocation had no direct effect on mental health outcomes, increased stress and job insecurity were closely associated with burnout and depression. This suggests that perceived stress, rather than external circumstances alone, determines vulnerability. Interventions that increase feelings of control, predictability, and security in the workplace are effective protective factors. Providing transparent and accurate information, improving communication about patient care protocols, and offering organizational support in adapting to rapid changes are key factors in strengthening resilience (Lee et al., 2018; Ruiz-Fernández et al., 2020).

As other studies have emphasized, accurate information and organizational support can increase healthcare workers' sense of competence and control, thereby reducing uncertainty and stress responses (Tokuda et al., 2009; Di Monte et al., 2020; Di Trani et al., 2021). The results also highlighted that non-medical staff may be particularly vulnerable to increased workloads and uncertainty, making targeted protective measures especially important for them. In this context, supportive relationships with colleagues and solidarity among coworkers are also important protective factors that can provide emotional reinforcement and practical assistance during stressful periods (Poncet et al., 2007).

The second study emphasized the importance of positive psychological resources, highlighting the role of compassion satisfaction (CS), which had a significant protective effect. CS is the satisfaction and fulfillment that comes from being able to help others and seeing one's work as meaningful and valuable. According to our longitudinal findings, CS moderated the development of emotional exhaustion (EE) and secondary traumatic stress (STS), with a powerful effect among frontline healthcare workers. It is noteworthy that the inclusion of CS in statistical models weakened the causal relationship between EE and STS, suggesting that higher levels of CS can interrupt possible maladaptive cycles between exhaustion and trauma-induced stress.

This is consistent with previous research showing that professionals who can maintain positive feelings about the meaning of their work report lower levels of burnout and trauma-related stress (Tremblay et al., 2011; Cieslak et al., 2014; Cummings et al., 2021). In this way, CS appears to be a psychological resource that not only counteracts the effects of stress but also promotes adaptive coping mechanisms, resilience, and long-term professional well-being.

Differences between frontline and non-frontline workers revealed further differences. While frontline workers reported higher overall levels of distress, CS proved to be a stronger protective factor among them than among non-frontline workers. A likely explanation is that frontline healthcare workers, despite the increased workload, worked in their usual clinical environment and performed routine tasks, thus enabling them to maintain their professional identity and sense of meaning in their work more strongly. In contrast, non-frontline workers experienced greater role confusion and discrepancies in working conditions, which may have weakened the positive reinforcing function of CS (Vagni et al., 2020). This difference highlights the need to tailor interventions to the needs of different groups of workers: programs that support reporting and CS reinforcement may be effective for frontline workers, while organizational support, clarification of roles, and conscious connection to the meaning of their work may help non-frontline workers.

Overall, the results suggest that protective factors operate at both organizational and psychological levels. Measures that increase predictability, ensure adequate information flow, and strengthen peer support can reduce subjective stress and thus prevent mental health deterioration. At the same time, cultivating positive psychological resources—such as compassion satisfaction—can mitigate the harmful effects of high workloads and

contribute to maintaining long-term resilience. These findings are consistent with the broader literature, which emphasizes the dual importance of systemic interventions and individual coping resources in protecting the mental health of healthcare workers (Ruiz-Fernández et al., 2020; Tremblay et al., 2011; Cummings et al., 2021; Rossi et al., 2023).

In summary, resilience during a pandemic can be understood not as an inherent trait, but as a dynamic interaction between external conditions and internal psychological resources. The results emphasize that targeted interventions—ranging from transparent organizational communication to programs that strengthen compassion satisfaction—can increase the adaptability of healthcare workers in the face of extreme stress. Recognizing and developing these is essential not only for mitigating immediate negative consequences but also for the long-term sustainability of the workforce.

8.4. Early protective factors in medical career socialization

Our research with healthcare workers during the COVID-19 pandemic highlighted how rapidly and profoundly the extreme psychological strain of the pandemic can lead to exhaustion, increased stress, and secondary traumatization. The second longitudinal study further emphasized that positive psychological protective factors—such as satisfaction derived from empathy—can mitigate and moderate these adverse effects over time. Our findings raise a crucial and prospective question: What protective factors can help future health professionals successfully cope with similar challenges early in their career socialization?

Medical students face numerous and well-documented difficulties during their training. Previous studies have consistently reported high levels of psychological stress, an increased risk of psychiatric comorbidities, and the onset of burnout syndrome already during medical education (Santen et al., 2010; Moir et al., 2018; Dyrbye et al., 2005). Burnout and stress are particularly concerning at this stage, as they often manifest as increased cynicism, which can undermine empathy, impair professional ideals, and, if not addressed in a timely and appropriate manner, compromise the quality of patient care in the longer term (Maslach & Leiter, 2016; Ishak et al., 2023). Our own study, which was partly cross-sectional and partly longitudinal, confirmed among medical students in Pécs that levels of cynicism increased significantly during the process of institutional

socialization, reflecting trends already described in the international literature (Brazeau et al., 2010; Kachel et al., 2020).

However, our results also revealed that the presence of patient-centered role models—although, according to students, it decreased somewhat during their years of training—continued to prove to be a significant protective factor. Together with empathy, these role models mitigated the otherwise marked increase in cynicism (Passi & Johnson, 2016; Batt-Rawden et al., 2013). This observation highlights the critical importance of positive role models and a person-centered, patient-oriented approach in the early stages of career socialization. The effect is not merely theoretical: engagement with positive role models shapes students' attitudes, strengthens professional identity, and provides coping resources that increase resilience and reduce vulnerability to burnout in the long term.

Notably, our study also demonstrated the independent effect of the timing of data collection. Between the two data collections—conducted before and during the COVID-19 pandemic—students reported increases in stress and cynicism, suggesting that the broader social and health environment could play a significant role in shaping psychological outcomes (Bartal & Lukács, 2022; Miller et al., 2020; Kaul et al., 2021). This finding is particularly noteworthy, as the first two studies in the dissertation documented the impact of precisely such external environmental stressors on practicing healthcare workers. Taken together, the results suggest that external crises, such as a pandemic, profoundly influence all stages of a medical career, from education to clinical practice.

Our findings thus contribute to a more nuanced understanding of how early protective factors operate in the context of medical education. Although stress and cynicism may be almost inevitable consequences of a demanding training environment and external crises, the presence of empathy and patient-centered role models can significantly mitigate these risks, which is consistent with the findings of the first two studies, which also showed that positive psychological factors are fundamental counterbalances to the psychological risks experienced by practicing health professionals. Parallel observations among different populations—healthcare workers already practicing their profession and students at the beginning of their career socialization—confirm that protective factors are universally relevant and that their active promotion is essential.

From a prevention perspective, this has several practical implications. First, the development and maintenance of empathy should be a priority in medical education—not only for its intrinsic professional value, but also because it has a protective effect on student well-being (Brazeau et al., 2010). Second, students must be provided with regular exposure to patient-centered role models by the educational institutions through mentoring programs, clinical supervision, and targeted demonstrations of humane patient care practices. Third, an institutional environment must be created that consciously considers the impact of social crises, such as pandemics, and thus helps students avoid internalizing increased stress as a personal failure. Taken together, these steps can not only strengthen individual student well-being but also contribute to the long-term resilience of the healthcare workforce.

In summary, our research has demonstrated that empathy and patient-centered role models are early protective factors that can enhance resilience and contribute to the prevention of burnout from the outset of medical training. Our findings are consistent with those of the first two studies and confirm the assumption that psychological protective factors play a crucial role throughout the entire medical career. Prevention and intervention should therefore not be postponed until professional practice but should begin at the earliest stage of career socialization. Applying these insights may be key to protecting the mental health of future healthcare workers and ensuring sustainable, high-quality patient care in the long term.

8.5. Limitations of the present research

This doctoral dissertation is based on three empirical studies that build on each other: (1) a large-scale cross-sectional survey among healthcare workers during the second and third waves of COVID-19 (Spányik et al., 2022); (2) a ten-month follow-up study of the same population (Spányik et al., 2023); and (3) a partly cross-sectional, partly repeated measurement study analyzing the dynamics of cynicism, empathy, and stress among Hungarian medical students (Spányik et al., 2024). Together, these studies provide important theoretical and practical insights, but they also have several methodological and conceptual limitations, which are summarized below.

1. Sampling and generalizability limitations

- **Voluntary, non-random sampling**: All three studies used convenience sampling to recruit participants. Although the HCW studies used a nationwide online questionnaire, participation was voluntary. Thus, the results are not necessarily representative of the entire national healthcare workforce. In the case of medical students, only students from one university were included in the study; this institutional focus and the relatively small sample size limit the external validity.

- **Subgroup sizes**: In the second wave of the longitudinal HCW study, the sample size (N = 386) was insufficient for a detailed analysis of heterogeneous subgroups (frontline vs. non-frontline, occupational groups), which may have affected statistical power and model stability.

2. Limitations related to measurement instruments and data structure

- **Self-report bias**: All three studies used questionnaire-based, self-reported data collection. The results obtained in this way may be influenced by social desirability, respondent fatigue, or memory bias. In addition, several variables (e.g., role model perception and some COVID-19-related background factors) were assessed using researcher-developed items rather than fully validated standardized instruments. Consequently, common method variance and measurement bias cannot be fully excluded.

- **Limited questionnaire length**: Due to the online platform, the length of the questionnaire was limited, so several potential protective or risk factors (e.g., resilience, detailed workplace conditions, social support) were not measured, the control of which would have allowed for a more nuanced explanation.

- **Measurement time frame**: 10 months elapsed between the two measurement points of the HCW longitudinal study; this interval may be short for capturing the dynamics of certain variables (e.g., stress levels) but long for others. In the medical student study, the time between the two measurements resulted in an inhomogeneous context due to several factors, notably the COVID-19 pandemic, which made individual-level matching difficult.

3. Limitations arising from the study design

- **Cross-sectional design**: The first HCW study and most of the medical student study were cross-sectional, so causal conclusions can only be drawn with marked cautions. Therefore, mediation pathways identified in the cross-sectional models should be interpreted primarily as theoretically informed statistical associations rather than definitive causal mechanisms.

- **Pandemic context**: All three data collections took place during the COVID-19 pandemic. The extreme work and living conditions associated with the pandemic may have amplified the effects of stressors while also limiting the generalizability of the results to peacetime. In medical student study, digital education and the involvement of students in public health tasks caused additional uncontrolled variation in experience and stress levels.

4. Limitations of the analysis

- **Lack of control variables**: The studies were unable to fully control the effects of organizational culture, leadership style, or specific classroom workload.

- **Sensitivity of complex statistical models**: Structural equation models are sensitive to measurement error and sample size; the smaller T2 sample (HCW longitudinal) and low response rate (medical students) may increase the uncertainty of estimates.

- **Model refinement procedures**: In the structural equation models, non-significant pathways were removed during model refinement. Although this approach improved model fit and interpretability, it also introduced a partially data-driven element into the final models, which should be considered when interpreting the confirmatory nature of the analyses.

- **Measurement invariance**: Although multigroup analyses were performed in some models, full measurement invariance across occupational and frontline subgroups was not formally examined for all constructs.

Overall, the most important common limitations of the three studies include non-representative sampling, bias in self-reporting measurement methods, and limitations in

causal and temporal inferences due to cross-sectional or low-frequency longitudinal study designs. Nevertheless, the studies provide valuable insights into critical aspects of the mental health of healthcare workers and medical students and can serve as an important starting point for future representative, multi-method, qualitative, and quantitative research.

8.6. Practical implications and future directions for mental health interventions

The results of the three studies described in this paper provide practical insights at multiple levels that can contribute to protecting the mental health of both healthcare workers and medical students.

First, the results highlight the need to design interventions that enhance the resilience of healthcare workers at the individual level in situations of heightened crisis, such as the COVID-19 pandemic. Developing psychological protective factors—such as empathy, compassion, satisfaction, or supportive professional communities—can have a preventive effect during times of excessive psychological stress. The targeted use of such interventions can help workers cope more effectively with crises and reduce the risk of burnout, depression, and secondary traumatization.

The data draw attention to particularly vulnerable populations, such as non-frontline healthcare professionals and skilled workers. These groups often receive less attention in crises, even though studies show that they may be the most vulnerable in terms of psychological stress. Future mental health interventions and organizational strategies should therefore pay increased attention to the needs of these groups and develop targeted support systems.

The studies described also contribute to the planning of practical interventions by revealing the relationships and sequences of processes along the stress-burnout-depression continuum. This supports the findings of other studies that also highlight the progressive nature of psychological stress (e.g., Maslach & Leiter, 2016). This insight provides an opportunity for interventions to break the negative spiral early in the process, preventing the development of more serious mental disorders.

The results of the longitudinal research also emphasize the protracted nature of trauma: psychological consequences can persist not only immediately, but also months or even

years after the crisis. This is a critical message in terms of health policy and organizational interventions, as it draws attention to the need to provide long-term mental health support to populations affected by crises. It is justified to follow up on the populations studied and to introduce targeted, organized, comprehensive psychological assistance.

The results of the student research highlight the importance of early prevention. Anxiety and burnout are already present among medical students during their training, which indicates that preventive interventions cannot be postponed until later stages of their professional careers. There is a need for mental health prevention programs that expand students' coping repertoire and teach them adaptive strategies that will continue to provide protection in the future. This is important not only for individual well-being but also for the quality of the doctor-patient relationship and the effectiveness of patient care.

Research also emphasizes the importance of positive psychological approaches. Factors such as satisfaction derived from empathy, supportive professional communities, and reflective practices not only play a role in reducing psychological stress but also actively contribute to professional satisfaction and long-term career retention. Based on this, it would be justified to apply positive psychology-based interventions more widely in healthcare organizations.

Of particular importance, these factors are not only relevant for the mental health of healthcare workers, but may also influence the quality of the doctor-patient relationship, patient satisfaction, and broader aspects of healthcare quality and safety, as suggested by previous research on physician burnout and patient care outcomes (Panagioti et al., 2018).

Finally, organizational-level observations have shown that subjective factors often play a greater role in psychological stress than objectively measurable workload indicators.

Management techniques, organizational culture, and the quality of communication are key factors that can either increase or alleviate the psychological stress of employees. This implies that interventions must be targeted not only at the individual level but also at the organizational level, with particular emphasis on managerial support, the creation of a supportive work environment, and the improvement of communication.

Overall, the practical implications of the research presented in this paper suggest that protecting mental health requires a multilevel approach: targeted interventions are needed

at the individual, organizational, and educational levels. The experiences of the COVID-19 pandemic and studies conducted among medical students confirm that early prevention and long-term support are crucial in mitigating the harmful consequences of burnout and psychological (West et al., 2016; World Health Organization, 2022).

These research findings are particularly significant at a time when the healthcare sector is facing a significant labor shortage, and when retaining and protecting the workforce, as well as reducing turnover, should be a priority for the national economy. Beyond the immediate implications for the well-being of healthcare professionals, safeguarding mental health is directly linked to the quality and safety of patient care, organizational stability, and the sustainability of healthcare systems (Shanafelt & Noseworthy, 2017; West, Dyrbye, Erwin, & Shanafelt, 2016). Investing in preventive and supportive measures is therefore not only an ethical imperative but also a strategic necessity to ensure a resilient workforce capable of meeting future public health challenges (Dyrbye et al., 2017).

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10. Appendices

10.1. Appendix A. Recruitment materials used in the healthcare worker studies

elte | ppk

COVID19 PANDÉMIA:

KÉRJÜK, SEGÍTSE AZ ELTE KUTATÁSÁT!



Kedves Kolléga!

Egy tudományos kutatásban való részvételhez szeretnénk a segítségét kérni. A kutatás célja, hogy képet kapjunk a SARS-COVID19 pandémia időszakában az orvosok és egészségügyi dolgozók mentális egészségéről.

A kutatásban való részvétel önkéntes, bármikor indoklás nélkül megszakítható. A kérdőív kitöltése 5-10 percet fog igénybe venni. A kutatás során kapott eredményekről később publikációk jelennek meg, és tudományos konferenciákon kerülnek ismertetésre. A kutatás során teljes névtelenséget biztosítunk az Ön számára, a kutatás során nyert adatokat csak összesítve kezeljük.

A kérdőív az alábbi linken érhető el:

https://elteppk.eu.qualtrics.com/jfe/form/SV_5hZR0qprsyOb6jX

Ha bármilyen kérdése, észrevétele lenne a kutatással kapcsolatban, kérjük, vegye fel velünk a kapcsolatot a **covid_mental@ppk.elte.hu** e-mail címen!

Pigniczkiné Rigó Adrien PhD.
ELTE Pszichológiai Intézet
Személyiség- és Egészségpszichológia Tanszék (a vizsgálat vezetője)

Demetrovics Zsolt PhD., DSc.
ELTE Pszichológia Intézet
Klinikai Pszichológia és Addiktológia Tanszék

dr. Spányik András
orvos, doktorandusz hallgató
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dr. Simon Dávid PhD.
ELTE Társadalomtudományi Kar
Statisztika Tanszék

10.1.1. Recruitment text (online survey)

Kedves Érdeklődő!

Szeretnénk felkérni egy tudományos kutatásban való részvételre melyet az Eötvös Loránd Tudományegyetem Pszichológiai Intézetének szakemberei terveztek és végeznek, Dr. Demetrovics Zsolt egyetemi tanár vezetésével. A kutatás az Eötvös Loránd Tudományegyetem Pedagógiai és Pszichológiai Kar Kutatásetikai Bizottságának engedélyével készül.

A kutatás célja, hogy képet kapjunk a SARS-COVID19 fertőzött páciensek ellátásában résztvevő orvosok és egészségügyi dolgozók mentális egészségéről. A kérdőív kitöltése kb. **5-10 percet** igényel.

A vizsgálatban való részvétel **önkéntes**, és teljesen **anonim** valamint **bármikor megszakítható**.

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10.2. Appendix B. Participant information and informed consent form for healthcare workers

10.2.1. Participant information sheet for healthcare workers

Tisztelt Résztvevő!

Ön egy tudományos kutatásban vesz részt, amelynek vezetője dr. Rigó Adrien docens (ELTE PPK), dr. Demetrovics Zsolt professzor (ELTE PPK), szervezője dr. Spányik András orvos, az ELTE Pszichológiai Doktori Iskola doktorandusza.

A vizsgálat alkalmával egy kérdőív kitöltésére kérjük fel, amely körülbelül 5-10 percet vesz igénybe.

A kutatás során vizsgálni szeretnénk az egészségügyi dolgozók SARS-COVID19 járvány során alkalmazott rendkívüli egészségügyi intézkedésekkel kapcsolatos megítélését. A kutatás további célja, hogy képet kapjunk a járványhelyzet egészségügyi dolgozókra gyakorolt mentális hatásairól.

Fontos tudnia, hogy a vizsgálatban való részvétel önkéntes, kitöltés bármikor indoklás nélkül megszakítható. A kutatásban szeretnénk követni a járvány mentális egészségre gyakorolt hatását, ennek érdekében későbbi időszakban megismételjük a kérőívek felvételét. Minden kitöltő válaszait a személy azonsítását közvetlenül lehetővé nem tevő egyedi azonosító segítségével követjük. Ezeket az egyedi azonosítókat az elemzés megkezdésekor visszvonhatatlanul megsemmisítjük.

Tájékoztatjuk, hogy szigorúan bizalmasan kezelünk minden olyan információt, amit a kutatás keretén belül gyűjtünk össze. A kutatás során nyert adatokat biztonságos számítógépen őrizzük. Az Önök által használt pszeudonim kódok alapján a kitöltő személye közvetlenül nem azonosítható. Ezekhez a kódokhoz kizárólag a kutatás vezetői férhetnek hozzá, azokat kizárólag a követéses vizsgálathoz használjuk fel. A kódokat az elemzési fázis elején visszavonhatatlanul töröljük. A kutatás során nyert adatokat táblázatban név nélkül összegezzük, statisztikai elemzéseket végzünk rajta, amelyekből egyetlen résztvevő azonossága sem állapítható meg.

Kérjük, hogy a kérdőíveken szereplő kérdések megválaszolásakor igyekezzék első megérzésére hagyatkozni, hiszen nincsenek jó vagy rossz válaszok, a saját érzéseire, választásaira vagyunk csak kíváncsiak.

10.2.2. Informed consent form

Az igen válasz megjelölésével elfogadom, hogy dr. Rigó Adrien docens (ELTE PPK), dr. Demetrovics Zsolt professzor (ELTE PPK) és dr. Spányik András (ELTE

Pszichológiai Doktori Iskola) által vezetett és lebonyolított vizsgálatban önként veszek részt. A kutatásról annak megkezdése előtt a fentiekben megfelelő tájékoztatást kaptam. Hozzájárulok ahhoz, hogy a kutatás során a rólam felvett, személyem azonosítására nem alkalmas adatok más kutatók számára is hozzáférhetők legyenek. Hozzájárulok továbbá ahhoz, hogy a kutatás során a kutatók a személyem azonosítására közvetlenül nem alkalmas egyedi azonosítót az elemzési fázis megkezdéséig kezeljék.
Fenntartom a jogot arra, hogy a kutatás során annak folytatásától bármikor elállhassak. Ilyen esetben a rólam addig felvett egyedi azonosító kódot törölni kell. Tudomásul veszem, hogy a kutatás eredményéről külön egyéni jelentés nem készül.

Kijelentem, hogy 18 éves elmúltam és a kutatásban való részvételem körülményeiről a fentiekben részletes tájékoztatást kaptam, a feltételekkel egyetértek, a részvételhez hozzájárulok. Fenntartom a jogot arra, hogy a vizsgálat során annak folytatásától bármikor elállhassak.

O igen O nem

Kelt: Budapest. .....év ....hó .. nap

Pigniczkiné Rigó Adrien PhD.

ELTE Pszichológiai Intézet

Személyiség- és Egészségpszichológia Tanszék

(a vizsgálat vezetője)

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10.3. Appendix C. Questionnaire used in the healthcare worker COVID-19 study

COVID hatása az orvosok mentális egészségére

Kedves Kitöltő!

Egy tudományos kutatásban való részvételhez szeretnénk a segítségedet kérni. **A kutatás célja, hogy képet kapjunk a SARS-COVID19 fertőzött páciensek ellátásában résztvevő orvosok és egészségügyi dolgozók mentális egészségéről**. A kérdőíves felmérés során a depresszió, az észlelt stressz, valamint az érzelmi kimerültség mértékéről szeretnénk képet kapni az egészségügyi dolgozók körében. A kutatás során vizsgálni tervezzük az egészségügyi veszélyhelyzet során alkalmazott rendkívüli egészségügyi intézkedések összefüggését a depresszió, az érzelmi kimerültség, valamint az észlelt stressz szintjével. A vizsgálat **kérdőívek** formájában, **több időpontban** fog zajlani, de az utánkövetésben való részvétel **nem kötelező.** A kutatás következő fázisában is, nagyjából **3-4 hét múlva** fogunk küldeni egy újabb kérdőívet. Az utolsó adatfelvétel várhatóan a korlátozások feloldását követően lesz. A kutatásban való részvétel **önkéntes**, amely bármikor indoklás nélkül akár végleg is **megszakítható**. A jelenlegi kérdőív kitöltése nagyjából **5-10 percet** fog igénybe venni. A kutatás során kapott eredményekről később publikációk jelennek meg, és tudományos konferenciákon kerülnek ismertetésre. Ezekről igény szerint írásos tájékoztatást adunk. Ahhoz, hogy a kutatás különböző dőpontjában felvett adatokat össze tudjuk párosítani, meg fogunk kérni egy **kód** megalkotására, amely azonvan természetesen nem lesz alkalmas az azonosításodra**.** A kutatás **során teljes névtelenséget biztosítunk számodra, a** kutatás során nyert adatokat csak összesítve kezeljük, A kérdőívben az instrukciók és tételek tegező formában szerepelnek a könnyebb érthetőség érdekében. Kérjük, ne vedd ezt tiszteletlenségnek! **Ha bármilyen kérdésed, észrevételed lenne a kutatással kapcsolatban, kérlek vedd fel velünk a kapcsolatot a *spanyikandras@gmail.com* e-mail címen!**

Pigniczkiné Rigó Adrien PhD.
ELTE Pszichológiai Intézet
Személyiség- és Egészségpszichológia Tanszék (a vizsgálat vezetője)

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dr.Spányik Andrásdoktorandusz hallgató
ELTE Pszichológiai Intézet
Személyiség- és Egészségpszichológia Tanszék dr. Simon Dávid PhD.ELTE
Társadalomtudományi KarStatisztika Tanszék

B2 Kijelentem, hogy 18 éves elmúltam és a kutatásban való részvételem körülményeiről a fentiekben részletes tájékoztatást kaptam, a feltételekkel egyetértek, a részvételhez hozzájárulok. Fenntartom a jogot arra, hogy a vizsgálat során annak folytatásától bármikor elállhassak.

○ Igen (1)

○ Nem (2)

B3 Kérjük, hozza létre azt a kódot, amelyikkel azonosíthatjuk a következő kérdezés során! Ez a kód azt a célt szolgálja, hogy adataidat össze tudjuk kapcsolni. Kérjük a kódot a következő módon alkossa meg:

○ Az Ön születési első vezetéknevének második betűje, ékezet nélkül (1)

_____

○ Az Ön személy első keresztnevének harmadik betűje, ékezet nélkül (2)

_____

○ Az Ön születési dátumának (éééehhnn) negyedik karaktere (3)

_____

○ Az Ön születési dátumának (éééehhnn) nyolcadik karaktere (4)

_____

○ Az Ön édesanyjának leánykori első vezetéknevének második karaktere, ékezet nélkül (5) _____

○ Az Ön édesanyjának leánykori első keresztnevének harmadik karaktere, ékezet nélkül (6) _____

Q01 Melyik évben született?

▼ 1930 (28) ... 2001 (99)

Q02 Mi az Ön neme?

- ○ Férfi (1)
- ○ Nő (2)

Q03 Milyen településen él Ön?

- ○ Főváros (1)
- ○ Megyeszékhely, megyei jogú város (2)
- ○ Város (3)
- ○ Községség (4)

Q04 Kérem jelölje, milyen munkakörben dolgozik?

- ○ Szakorvos (1)
- ○ Rezidens orvos (2)
- ○ Osztályos orvos (3)
- ○ Egészségügyi szakdolgozó (4)
- ○ Egyéb egészségügyi dolgozó (5)
- ○ Pszichológus (6)

Q05 Hány éve dolgozik az egészségügyben?

- ○ Kevesebb, mint 1 éve (1)
- ○ 1-2 éve (5)
- ○ 2-3 éve (6)
- ○ 3-5 éve (7)
- ○ 5-10 éve (9)
- ○ 10-15 éve (10)
- ○ Több, mint 15 éve (11)

Q06 Kérem jelölje be az Ön esetében igaz állítást!

- ○ Jelenleg saját osztályomon dolgozom (1)
- ○ Jelenleg saját kórházamban dolgozom, de másik osztályára vezényeltek (2)
- ○ Jelenleg másik kórházba vezényeltek és ott dolgozom (3)

Q07 Kérem, jelölje jelenleg milyen területen dolgozik ? ***Több választ is megjelölhet!***

- ○ Alapellátás (1)
- ○ Szakellátás (2)
- ○ Kórház NON-COVID részlegén (3)
- ○ Kórház COVID pozitív páciensek ellátására kijelölt belgyógyászati részlegén (4)
- ○ Kórház COVID pozitív páciensek ellátására kijelölt intenzív terápiás részlegén (5)
- ○ Kórház Sürgősségi Betegellátó Osztályán (SBO) (6)
- ○ Kórház COVID pozitív páciensek ellátására kijelölt egyéb részlegén (7)
- ○ Mentőszolgálat (8)

Q08 Kérem, jelölje be az Ön esetében igaz állítást!

- ○ Egyelőre nem estem át SARS-COVID19 fertőzésen, (1)
- ○ Jelenleg is SARS-COVID19 fertőzött vagyok enyhe tünetekkel/tünetmentesen (2)
- ○ Jelenleg is SARS-COVID19 fertőzött vagyok közepesen súlyos/súlyos tünetekkel (3)
- ○ Átestem a SARS-COVID19 fertőzésen enyhe tünetekkel/tünetmentesen (4)
- ○ Átestem a SARS-COVID19 fertőzésen közepesen súlyos/súlyos tünetekkel (5)

Q19 Kérjük, gondoljon vissza a SARS-COVID19 járvány előtti időszakra, és az alábbi skálán jelölje be, mennyire érzi igaznak magára az alábbi állításokat jelen helyzetben?

Az 1-es válasz azt jelenti, egyáltalán nem ért egyen, a 7-es pedig azt, teljes mértékben egyetért.

	1- Egyáltalán nem értek egyet (1)	2 (2)	3 (3)	4 (4)	5 (5)	6 (6)	7- Teljes mértékben egyetértek (7)
Munkám mennyisége megnövekedett. (3)	○	(	(	(	(	(	○
Kevésbé érzem biztonságban magam munkám során. (4)	○	(	(	(	(	(	○
Aggódom a testi egészségem miatt. (5)	○	(	(	(	(	(	○
Aggódom lelki egészségem miatt. (6)	○	(	(	(	(	(	○
Beosztásom, munkarendem kistámíthatatlanabb. (7)	○	(	(	(	(	(	○

Q09 Kérem jelölje 1-7 közötti számmal, mennyire ért egyet az alábbi állításokkal? Az 1-es azt jelenti, egyáltalán nem ért egyet az állítással, a 7-es pedig azt jelenti, teljes mértékben egyetért az állítással.

	Egyáltalán nem ért egyet 1 (1)	2 (2)	3 (3)	4 (4)	5 (5)	6 (6)	Teljes mértékben egyetért 7 (7)
Megfelelő oktatást kaptam a SARS-COVID19 fertőzésben szenvedő páciensek ellátásával kapcsolatban. (1)	○	(	(	(	(	(	○
Megfelelő minőségű és mennyiségű védőeszköz áll rendelkezésre a SARS-COVID fertőzött páciensek ellátásához. (2)	○	(	(	(	(	(	○
Megfelelő mennyiségű pihenésre van lehetőség a munkám során. (3)	○	(	(	(	(	(	○
Jelenlegi munkahelyemen az általam megszokottnál súlyosabb betegek ellátását végzem. (4)	○	(	(	(	(	(	○
Jelenlegi munkahelyemen a megváltozott munkaidő beosztás lelki megterhelést okoz számomra. (5)	○	(	(	(	(	(	○
Aggódom, hogy családtagjaimat megfertőzőm. (6)	○	(	(	(	(	(	○
Másodállásom ellehetetlenülése egzisztenciális nehézségeket okoz. (7)	○	(	(	(	(	(	○
Aggódom saját testi egészségem miatt. (8)	○	(	(	(	(	(	○
Jelenlegi munkahelyemen nagyobb a lelki megterhelés. (9)	○	(	(	(	(	(	○

Q10 Kérjük értékelje az alábbi állításokat önmagára vonatkoztatva az alábbiak szerint!

	Egyáltalán nem jellemző (1)	Alig jellemző (2)	Jellemző (3)	Teljesen jellemző (4)
Minden érdeklődésemet elvesztettem mások iránt. (1)	○	○	○	○
Semmiben sem tudok dönteni többé. (2)	○	○	○	○
Több órával korábban ébredek, mint szoktam, és nem tudok újra elaludni. (3)	○	○	○	○
Túlságosan fáradt vagyok ahhoz, hogy bármit csináljak. (4)	○	○	○	○
Annyira aggódom a testi-fizikai panaszok miatt, hogy másra nem tudok gondolni. (5)	○	○	○	○
Semmiféle munkát nem vagyok képes ellátni. (6)	○	○	○	○
Úgy látom, hogy a jövőm reménytelen, és helyzetem nem fog változni. (7)	○	○	○	○
Mindennel elégedetlen vagy közömbös vagyok. (8)	○	○	○	○
Állandóan hibáztatom magam. (9)	○	○	○	○

Q11 Az alábbi kérdések azokra az érzésekre és gondolatokra vonatkoznak, amelyek Önt AZ ELMÚLT HÓNAP SORÁN jellemezték. Kérjük, hogy minden egyes kérdésnél írja be, hogy az elmúlt hónap során MILYEN GYAKRAN volt jellemző Önre az adott érzés

vagy gondolat! A legjobb, ha minden kérdésre gyorsan válaszol. Tehát ne próbálja megszámolni, hogy hányszor érezte magát egy adott módon, hanem írja be azt a választ, ami a leginkább jellemzõnek tűnik!

	Soha (1)	Szinte soha (2)	Néha (3)	Elég gyakran (4)	Nagyon gyakran (5)
Az elmúlt hónap során milyen gyakran érezte úgy, hogy képtelen kézben tartani azokat a dolgokat, amelyek fontosak az életében? (1)	○	○	○	○	○
Az elmúlt hónap során milyen gyakran bízott magában, hogy képes megoldani személyes problémáit? (2)	○	○	○	○	○
Az elmúlt hónap során milyen gyakran érezte úgy, hogy a dolgok az Ön kedve szerint alakulnak? (3)	○	○	○	○	○
Az elmúlt hónap során milyen gyakran érezte úgy, hogy a nehézségek úgy felhalmozódtak, hogy már nem tud úrrá lenni rajtuk? (4)	○	○	○	○	○

Q12 Az alábbiakban 8 állítást olvashat a munkájával kapcsolatban. Mindegyik mellett 0-6-ig egy számsort talál, melyen jelölje meg, milyen fokban jellemző az állítás Önre. A 0 azt jelenti, hogy soha nem érezte, a 6 pedig azt, hogy minden nap érzi, míg a többi szám értelemszerűen egyre növekvő gyakoriságot jelent.

	Soha 0 (1)	1 (2)	2 (3)	3 (4)	4 (5)	5 (6)	Minden nap 6 (7)
A munkám érzelmileg kimerít. (1)	○	(	(	(	(	(	○
A nap végére elhasználtnak érzem magam. (2)	○	(	(	(	(	(	○
Kimerültnek érzem magam, mikor reggel egy újabb munkanappal kell szembenéznem. (3)	○	(	(	(	(	(	○
Egész nap emberekkel foglalkozni igazán kimerítő, és feszültségkeltő számomra. (4)	○	(	(	(	(	(	○
Kiégettnek érzem magam a munkámtól. (5)	○	(	(	(	(	(	○
Frusztráltnak érzem magam a munkámtól. (6)	○	(	(	(	(	(	○
Túl sok stresszt okoz számomra az, hogy emberekkel dolgozom. (7)	○	(	(	(	(	(	○
Úgy érzem, hogy erőim végén tartok. (8)	○	(	(	(	(	(	○

Q13 Mikor ön másokat segít, akkor az érintettek életével közvetlen kapcsolatba kerül. Ahogy azt már észrevehette, az ön által segített, gondozott személyek iránti együttérzése egyszerre gyakorolhat önre pozitív és negatív hatást. Az itt található kérdések az ön élményeire vonatkoznak, pozitívokra és negatívakra egyaránt.Gondoljon át minden egyes kérdést, önről és munkahelyi helyzetéről. Válassza ki azt a választ, ami a lehető legjobban mutatja, milyen gyakran élte át az egyes felsorolt élményeket az elmúlt 30 napban.

	Soha (1)	Ritkán (2)	Néha (3)	Gyakran (4)	Nagyon gyakran (5)
Egynél több személyért aggódom azok közül, akiket ellátok. (1)	○	○	○	○	○
Megriadok vagy összerezzenek a hirtelen zajoktól. (11)	○	○	○	○	○
Nehezen tudom különválasztani a magánéletemet a [segítő] foglalkozásomtól. (12)	○	○	○	○	○
Úgy vélem, az általam segített személy megélt traumatikus stressze engem is megvisel. (13)	○	○	○	○	○
A segítő foglalkozásom miatt számos különböző dolog miatt is idegeskedem. (14)	○	○	○	○	○
Lehangoltnak érzem magamat az általam segített emberek traumatikus élményei miatt. (15)	○	○	○	○	○
Úgy érzem, én is átélem az általam segített személyek traumáját. (16)	○	○	○	○	○
Kerülök bizonyos tevékenységeket vagy helyzeteket, mert olyan félelmetes tapasztalatokra emlékeztetnek, amiket azok éltek át, akiket segítek. (8)	○	○	○	○	○
A munkámból eredő tolakodó és ijesztő gondolataim vannak. (19)	○	○	○	○	○
Nem tudok visszaemlékezni a traumát átélt személyekkel kapcsolatos munkám egyes fontos részleteire. (20)	○	○	○	○	○

10.4. Appendix D. Participant information sheets and informed consent forms for medical students and staff members involved in questionnaire administration

10.4.1. Informed consent form for paper-based questionnaires

Név:
Születési idő:
Kijelentem, hogy a dr. Rigó Adrien docens (ELTE PPK), dr. Demetrovics Zsolt professzor (ELTE PPK) és dr. Spányik András (ELTE Pszichológiai Doktori Iskola) által vezetett és lebonyolított izsgálatban önként veszek részt. A vizsgálat jellegéről annak megkezdése előtt megfelelő tájékoztatást kaptam.
Tudomásul veszem, hogy az azonosításomra alkalmas személyi adataimat bizalmasan kezelik.
Hozzájárulok ahhoz, hogy a vizsgálat során a rólam felvett, személyem azonosítására nem alkalmas adatok más kutatók számára is hozzáférhetők legyenek.
Fenntartom a jogot arra, hogy a vizsgálat során annak folytatásától bármikor elállhassak. Ilyen esetben a rólam addig felvett adatokat törölni kell.
Tudomásul veszem, hogy a vizsgálat eredményéről külön egyéni jelentés, összegzés nem készül.

Kijelentem, hogy elmúltam 18 éves.

Kelt:....., 201..... év ..... hó..... nap

_____
a személy aláírása

10.4.2. Information sheet for staff members of the Institute of Behavioural Sciences

Kedves Kolléga!

A kutatás során vizsgálni szeretnénk a hallgatók által észlelt stressz, valamint a tanulással kapcsolatos kiégés szintjét, továbbá szeretnénk képet kapni az orvostanhallgatók empatikus készségeiről és az igénybe vehető mentálhigiénés, pszichológiai segítséggel kapcsolatos megítélésükről.
Kutatásunkban első-, harmad-, illetve ötöd éves hallgatókkal szeretnénk önkitöltéses kérdőíveket elvenni. A kérdőíveket a szemináriumi órák alkalmával tervezzük kitöltetni az Önök közreműködésével. A kérdőív kitöltése 15-20 percet vesz igénybe. A kitöltést megelőzően írásos ájékoztatók, valamint a kutatásban való részvételbe beleegyező nyilatkozatok kiosztására is megkérjük Önöket!
A hallgatók vizsgálatban való részvétele önkéntes. A kutatásban szeretnénk követni az egyetemi képzés, valamint az igénybe vehető mentálhigilénés segítségek kiégésre és észlelt stresszre gyakorolt hatását, ennek érdekében későbbi tanévek szemináriumi óráin

a kérőívek felvételének megismétlését tervezzük. Ennek érdekében minden kitöltő számára egyedi azonosítót osztunk ki a kérdőívek mellett, melynek segítségével a kitöltő névtelensége megőrizhető. A hallgatók számára, kérjük a névvel ellátott, lezárt borítékokat adják át. A borítékokban egyedi azonosítókkal ellátott kérdőívek, kutatási tájékoztatók, valamint beleegyező nyilatkozatok találhatóak. A nevek és az egyedi azonosítók párosítását tartalmazó dokumentumot kizárólag a kutatás vezetője láthatja, azt elzárva tárolja. Szigorúan bizalmasan kezelünk minden olyan információt, amit a kutatás keretén belül gyűjtünk össze. A kutatás során nyert adatokat biztonságos számítógépen őrizzük. A kutatás során nyert adatokat táblázatban név nélkül összegezzük, statisztikai elemzéseket végzünk rajta, amelyekből egyetlen résztvevő azonossága sem állapítható meg.
Fontos, hogy a lebonyolítás segítőjeként törekedjen a kérdőívek kitöltése során nyugodt légkört, megteremtésére. A kérdőíveket minden esetben zárt, csendes helyen töltsék ki a hallgatók, ahol 15- 20 percen át nem zavarják meg a kitöltést és az anonimitás megőrzése érdekében egymás kérdőíveire nem látnak rá. A kitöltött kérdőíveket, valamint a beleegyező nyilatkozatokat a kutatás vezetőjének történő átadásáig zárt helyen szükséges őrizni, ahhoz harmadik személy nem férhet hozzá.
Kérjük, amennyiben egyetért a fenti feltételekkel, és hozzájárul a kutatásban való közreműködéshez, a beleegyező nyilatkozatot lássa el aláírásával!

10.4.3. Informed consent form for assisting with questionnaire administration

Név:
Egyetem,kar,beosztás:

Kijelentem, hogy a dr. Rigó Adrien docens (ELTE PPK), dr. Demetrovics Zsolt professzor (ELTE PPK) és dr. Spányik András (ELTE Pszichológiai Doktori Iskola) által vezetett vizsgálat jellegéről, céljairól és tartalmáról megfelelő tájékoztatást kaptam, azokkal egyet értek és vállalom a kérdőívek kitöltetésében való közreműködést, valamint a kitöltéshez szükséges nyugodt légkör megteremtését.
A hallgatók azonosítására alkalmas személyi adatokat nem kezelek. A kutatás anonim kérdőíveit megőrzöm és azt maradéktalanul átadom a kutatás vezetőinek.

Kelt:....., 201..... év ..... hó..... nap

_____
a személy aláírása

10.5. Appendix E. Medical student questionnaire

Tisztelt Orvostanhallgató! Kedves Kolléga!

A jelen kérdőív egy országos kutatás része, amelyben az orvostanhallgatók közérzetét, pszichés terhelését és annak egyes összefüggéseit vizsgáljuk. A kérdésekre nincsenek jó és rossz válaszok, kérem, próbáljon meg minél őszintébben a saját véleménye és érzései szerint válaszolni rájuk! Kérem, hogy a könnyebb feldolgozás érdekében a válaszait a válaszalapra írja be és NE ÍRJON

ERRE A LAPRA (ezzel csökkenti a papírfelhasználást és védi a környezetet)! A kutatás anonim és önkéntes, egyedi adatokat nem teszünk közzé. Ne felejtse el kitölteni és aláírni az adatkezelési hozzájárulást és beletenni a sorszámozott borítékba!

Segítségét és támogatását előre is köszönöm!

Dr. Spányik András
orvos, kutató

Demográfiai kérdések

1. Melyik évben született Ön?

2. Mi az Ön neme?

1. Férfi
2. Nő

3. Kérem, jelölje meg, hogy kikkel él egy háztartásban?

1. Egyedül élek
2. Szülővel/szüleimmel élek
3. Házastársammal/élettársammal/barátnőmmel élek
4. Házastársammal/élettársammal/barátnőmmel és gyermeke(i)mmel
5. Gyermeke(i)mmel élek (egyedül nevelem)
6. Egyéb rokonommal élek
7. Egyéb nem rokonommal élek (barátok, albérlet)

3/A. Ha az előző kérdésre azt válaszolta, hogy férjével, illetve feleségével, élettársával él (4 válaszlehetőséget jelölte) Az imént azt mondta, hogy a

férjével/feleségével/partnerével él együtt. Az alább szereplő leírások közül melyik illik a kapcsolatukra?

1. Törvényes házasok vagyunk
2. Azonos neműek közötti bejegyzett élettársi kapcsolatban
3. Élettársi kapcsolatban élünk
4. Elváltunk / felbontottuk a bejegyzett élettársi kapcsolatunkat

4. .Volt valaha válása, vagy bontott már fel bejegyzett élettársi kapcsolatot?

1. Igen
2. Nem

5. Milyen típusú településen nőtt fel?

3. Főváros
4. Megyei jogú város
5. Város
6. Falu/község
7. Tanya

6. Rendelkezik-e egyéb felsőfokú végzettséggel?

1. Igen, éspedig: …….
2. Nem

7. Kérem, válassza ki az alábbi lehetőségek közül, egyetem után mely területen szeretne elhelyezkedni? (Ha jelenleg többet is el tud képzelni, írja be a három legvalószínűbbet!)

1. Alapellátásban gyakorló orvosként
2. Klinikus, szomatikus szakorvosként
3. Pszichiáterként
4. Kutatóorvosként
5. Egyetemi oktatóként
6. Gyógyszergyárnál orvoslátogatóként
7. Egészségügyi menedzserként
8. Nem szeretnék az egészségügy területén dolgozni a jövőben
9. Egyéb, éspedig: .....

8. Kérem, jelölje, hogy későbbi munkájához mennyire tartja hasznosnak az alábbi tantárgyakat? Kérem, írjon 1-est a válaszlapra, ha a tárgyat egyáltalán nem tartja

hasznosnak és 5-öst ha kiemelkedően hasznosnak tartja. Ha esetleg nem tudja megítélni, írjon 9-est! Használja az 1-5 közötti számokat is!

8.1. Anatómia

8.2. Élettan

8.3. Biokémia

8.4. Kórélettan

8.5. Gyógyszertan

8.6. Belgyógyászat

8.7. Pszichiátria

8.8. Sebészet

8.9. Orvosi antropológia

8.10. Orvosi szociológia

8.11. Orvosi pszichológia

9. Kérem, adja meg, hogy az alábbi állítások mennyire jellemzőek Önre, illetve az Ön tapasztalata szerint! Írjon a válaszlapra 1-et ha úgy gondolja, hogy egyáltalán nem jellemző és 5-öst, ha úgy gondolja, hogy teljes mértékben jellemző. Ha esetleg nem tudja megítélni, írjon 9-est! Használja az 1-5 közötti számokat is!

9.1. Az elméleti oktatás során az oktatóim hangsúlyozták a holisztikus (bio-pszicho-szociális) modell fontosságát

9.2. A klinikai képzés során az orvos oktatók hangsúlyozták a holisztikus (bio-pszicho-szociális) modell jelentőségét

9.3. A klinikus orvosok a holisztikus (bio-pszicho-szociális) szemlélet jegyében látják el a pácienseket

9.4. Fontosnak tartom a holisztikus (bio-pszicho-szociális) szemlélet alkalmazását a betegellátás során

9.5. Valószínűnek tartom, hogy későbbi orvosi tevékenységem során holisztikus (bio-pszicho-szociális) szemléletben tudom ellátni pácienseimet

10. Kérem, jelölje az alábbi táblázatban, hogy az alábbi állítások mennyire jellemzőek az Ön tapasztalata szerint! Egyrészt jelölje, hogy általánosan az

oktatókra mennyire jellemzőek az állítások, másrészt jelölje az Ön számára leginkább meghatározó oktatót is!

Kérem, jelölje a válaszlapra 1-7 között számot beírva, hogy mennyire jellemző az állítás, ahol az 1-es egyáltalán nem jellemző, a 7-es a teljes mértékben jellemző!

Állítás	**Általában az oktatókra jellemző (jelezze 1 től 7 ig)**	**Legmeghatározóbb oktatómra jellemző (jelezze 1-től 7-ig)**
10.1. A pácienseket partnernek tekinti és tájékoztatja őket a kezelés minden fontos részletéről		
10.2. Orvosi pozíciójának megfelelően tanári, szülői minőségében szól a páciensekhez, hiszen tudja, hogy mi a megfelelő a páciensek számára		
10.3. Kifejezett alázattal viseltetik a páciensek iránt, mivel úgy tartja, az orvosi hivatás szolgálat		

11. <u>Egyetemi éveit megelőzően</u> vett-e igénybe pszichológiai, mentálhigiénés segítséget (coaching, pszichoterápia, pszichiátriai konzultáció, pszichológiai tanácsadás, realaxáció, mindfulness)?

1. Igen
2. Nem

11/A. Ha az előző kérdésre igennel válaszolt, kb. hány alkalommal? Kérem, írja le számmal.

Kb. ……. alkalommal vettem részt ilyenen.

12. <u>Egyetemi évei során</u> vett-e igénybe pszichológiai, mentálhigiénés segítséget? Kérem, karikázza be válasza számát!

3. Igen
4. Nem

12/A. Ha igen, kb. hány alkalommal? Kérem, írja le számmal.

Kb. ……. alkalommal vettem részt ilyenen

13. Elképzelhetőnek tartja-e, hogy a későbbiek során pszichológiai, mentálhigiénés segítséget vesz majd igénybe? Kérem, karikázza be a válaszához tartozó számot!

5. Teljesen kizártnak tartom
6. Nehezen elképzelhetőnek tartom
7. Lehet, hogy igen, lehet, hogy nem
8. Valószínűnek tartom
9. Biztosan szükségem lesz erre
9. Nem tudom megítélni

14. Hallott Ön a Bálint csoportokról?

10. Igen
11. Nem

Ha nem, akkor kérem, lépjen tovább a 16. kérdésre

15. Egyetemi évei során vett-e részt Bálint csoporton (Junior Bálint)?

12. Igen
13. Nem

15/A. Ha igen, kb. hány alkalommal? Kérem, írja le számmal!

Kb. ……. alkalommal vettem részt Bálint-csoporton

16. Következő egyetemi évei során tervezi-e, hogy részt vesz Bálint csoporton (Junior Bálint)?

10. Kizártnak tartom
11. Nem tartom valószínűnek
12. Lehet, hogy igen, lehet, hogy nem
13. Valószínűnek tartom
14. Biztosan részt veszek ilyenen

17. Praktizáló orvosként elképzelhetőnek tartja-e, hogy részt fog venni Bálint csoporton?

15. Kizártnak tartom
16. Nem tartom valószínűnek
17. Lehet, hogy igen, lehet, hogy nem
18. Valószínűnek tartom
19. Biztosan részt veszek ilyenen

18. Kérem, jelölje be az alábbiak közül az Ön esetében igaz állítást (több válasz is jelölhető)!

20. Családomban én vagyok az első orvos
21. Szüleim között van orvos
22. Nagyszüleim között van orvos
23. Van orvos foglalkozású testvérem

19. Kérem, jelölje be, melyik állítás leginkább igaz önre az alábbiak közül!

24. Óvodás korom óta orvos szerettem volna lenni
25. Általános iskolás korom óta orvos szerettem volna lenni
26. Gimnáziumi éveim óta szeretnék orvos lenni
27. Nem emlékszem, mióta szeretnék orvos lenni
28. Szüleim szerették volna, hogy orvos legyek, nem az én választásom

20. Kérem, jelölje "iskolai osztályozással", mennyire váltotta be a hozzá fűzött reményeket egyetemi képzése!

1 2 3 4 5

egyáltalán nem váltotta be a hozzá fűzött reményeket — **teljes mértékben elégedett vagyok vele**

Amennyiben 3, vagy annál jobb érdemjegyet jelölt egyetemi képzésére, akkor lépjen tovább a 22. kérdésre.

21. Amennyiben elégedetlen képzésével (az előző kérdésre 1-es vagy 2-es érdemjegyet adott), kérem, adja meg az alábbi lehetőségek közül, hogy mik voltak döntésének legfőbb okai. (Kérem, jelöljön legfeljebb 3 választ!)

29. Túl nagy a tananyag mennyisége
30. Más típusú tananyagot oktatnak, mint, amire számítottam
31. Elvesztettem a motivációmat az egyetemi évek során
32. Nem találom a hangot a többi hallgatóval
33. A tanáraim hozzáállásával van problémám
34. A páciensek hozzáállásával van problémám
35. Az orvosi munkával járó kihívások miatt
36. Az orvosi pálya alacsony presztízse miatt
37. Egyéb, éspedig: .....

22. Amennyiben első éves hallgató, az alábbi kérdés nem vonatkozik Önre, kérem ugorjon a következő (23-as) kérdésre!

Mennyire tud jólesően belemélyedni tanulmányaiba, illetve mennyiben nyomasztják a feladatai? Kérem, írjon 1-7 közötti számot a válaszlapra, ahol 1 jelöli azt, hogy egyáltalán nem jellemző, illetve soha nem fordul elő és a 7 jelöli azt, hogy teljes mértékben jellemző, gyakran előfordul.

22.1. Úgy érzem, a tanulás érzelmileg kimerít

22.2. Már a reggeli felkeléskor fáradt vagyok, ha egy újabb egyetemi nappal kell szembenéznem

22.3. Cinikusabbá váltam abban a kérdésben, hogy a tanulmányaimnak van-e egyáltalán valami haszna

22.4. Hatékonyan meg tudom oldani a problémákat, amelyekkel tanulmányaim során találkozom

22.5. Hiszem, hogy érdemben hozzá tudok járulni a látogatott órákon folyó munkához

22.6. Szerintem jó diák vagyok

22.7. Inspirál, ha elérem a tanulmányaimban kitűzött céljaimat

22.8. Kételkedem tanulmányaim fontosságában és értékében

22.9. Biztos vagyok benne, hogy az órákon jól teljesítek

22.10. A tanulás, az órákra járás szorongással tölt el

22.11. Egy egyetemi nap végére elhasználtnak érzem magam

22.12. Kiégettnek érzem magam a tanulásban

22.13. Kevésbé érdekelnek már a tanulmányaim ahhoz képest, mint mikor beiratkoztam az egyetemre

22.14. Már kevésbé lelkesít a tanulás

22.15. Sok érdekeset tudtam meg tanulmányaim során

23. A következő állítások az ön különböző szituációkban átélt gondolataira és érzéseire kérdeznek rá. Kérem, olvassa el az állításokat alaposan, és ítélje meg, hogy mennyire jellemzőek azok önre. Használjon 5 fokú skálát a válaszlapont, ahol 1 -

Egyáltalán nem jellemző rám, 5 - Nagyon jellemző rám. Használhatja az 1-5 közötti számokat is!

23.1. Elég gyakran álmodozom és fantáziálok olyan dolgokról, amelyek megtörténhetnek velem.

23.2. Gyakran gondolok aggodalommal és együttérzéssel azokra az emberekre, akiknek a sorsa kevésbé szerencsés, mint az enyém.

23.3. Olykor nehézséget okoz, hogy a dolgokat a másik személy nézőpontjából ítéljem meg.

23.4. Megesik, hogy nem nagyon szomorít el mások problémája.

23.5. Nagyon bele tudom élni magam egy regényhős érzéseibe.

23.6. Veszélyhelyzetben szorongás fog el és igen kényelmetlenül érzem magam.

23.7. Általában tárgyilagos maradok, ha filmet vagy színdarabot nézek, nem élem bele magam teljesen a cselekménybe.

23.8. Vitás kérdésekben megpróbálom minden egyes vitapartner nézőpontját figyelembe venni, mielőtt magam döntenék.

23.9. Ha azt látom, hogy valakit kihasználnak, többnyire felveszem a „védő” szerepét.

23.10. Olykor tehetetlennek érzem magam, ha erős érzelmekkel teli szituációba kerülök.

23.11. Olykor úgy próbálom megérteni barátaimat, hogy elképzelem, milyenek lehetnek a dolgok az ő nézőpontjukból tekintve.

23.12. Ritkán fordul velem elő, hogy teljesen elmerülök egy jó könyvben vagy filmben.

23.13. Megpróbálok nyugodt maradni, ha azt látom, hogy valakit megsértettek.

23.14. Mások balszerencséje nem szokott túlzottan igénybe venni.

23.15. Ha tudom, hogy valamiben igazam van, nem vesztegetem az időmet azzal, hogy mások érveit végighallgassa.

23.16. Miután megnéztem egy színdarabot vagy filmet, úgy érzem magam, mintha én lettem volna az egyik szereplő.

23.17. Megriadok, ha érzelmileg feszült helyzetbe kerülök.

23.18. Olykor nem érzek túl nagy sajnálatot, ha azt látom, hogy igazságtalanul bánnak valakivel.

23.19. Vészhelyzetben általában elég jól megállom a helyemet.

23.20. Többnyire érzékenyen érintenek azok az események, amelyeknek tanúja vagyok.

23.21. Azt hiszem, minden kérdésnek két oldala van, ezért megpróbálom mindkettőt megismerni.

23.22. Lágyszívű emberként jellemezhetném magam.

23.23. Ha egy jó filmet nézek, könnyen bele tudom képzelni magam a főhős helyébe.

23.24. Vészhelyzetekben elveszítem a fejem.

23.25. Ha valami felidegesít, általában leállok egy percre, és megpróbálom magam a másik helyébe képzelni.

23.26. Ha egy érdekes novellát vagy regényt olvasok, elképzelem, hogy én mit éreznék, ha mindaz, amiről szó van, velem történne.

23.27. Nagyon kikészülök, ha azt látom, hogy valakinek nagy szüksége volna segítségre, mert vészhelyzetbe került.

23.28. Mielőtt bárkit kritizálnék, megpróbálom elképzelni, hogy érezném magam az ő helyében.

24. A következőkben 10 állítást lát. Kérjük, gondolja végig minden állításnál, hogy milyen mértékben volt jellemző Önre az adott kijelentés az elmúlt egy hónapban. Írjon a válaszlapra 1-est, ha egyáltalán nem volt jellemző az előző egy hónapban, illetve 5-öst, ha nagyon jellemző volt önre az elmúlt egy hónapban. Használhatja az 1-5 közötti számokat is!

24.1. Képes vagyok arra, hogy alkalmazkodjak a változásokhoz.

24.2. A stresszel való megküzdés megerősít.

24.3. Mindig a legnagyobb erőbedobással cselekszem, mindegy, hogy miről van szó.

24.4. Amikor a dolgok reménytelennek tűnnek, akkor sem adom fel.

24.5. Tisztán gondolkodom és koncentrálok, amikor nyomás alatt vagyok.

24.6. Erős emberként gondolok magamra.

24.7. A megérzéseim alapján kell cselekednem.

24.8. Nagyon céltudatos vagyok.

24.9. Úgy érzem, én irányítom az életemet.

24.10. Dolgozom azért, hogy elérjem a céljaimat

25. Az alábbi kérdések azokra az érzésekre és gondolatokra vonatkoznak, amelyek Önt AZ ELMÚLT HÓNAP SORÁN jellemezték. Kérjük, hogy minden egyes kérdésnél írja a válaszlapra, hogy az elmúlt hónap során MILYEN GYAKRAN volt jellemző Önre az adott érzés vagy gondolat! Néhány kérdés ugyan hasonlónak tűnik, de valójában különbözőek, ezért kérjük, hogy valamennyit külön kérdésként kezelje! A legjobb, ha minden kérdésre gyorsan válaszol. Tehát ne próbálja megszámolni, hogy hányszor érezte magát egy adott módon, hanem írja be azt a választ, ami a leginkább jellemzőnek tűnik! Vászainál az alábbi kódokat használja:

1 – soha 2 – szinte soha 3 – néha 4 – elég gyakran 5 – nagyon gyakran

25.1. Az elmúlt hónap során milyen gyakran volt feszült valamilyen váratlan esemény miatt?

25.2. Az elmúlt hónap során milyen gyakran érezte úgy, hogy képtelen kézben tartani azokat a dolgokat, amelyek fontosak az életében?

25.3. Az elmúlt hónap során milyen gyakran érezte magát idegesnek és stresszesnek?

25.4. Az elmúlt hónap során milyen gyakran kezelte sikeresen a hétköznapi bosszúságokat?

25.5. Az elmúlt hónap során milyen gyakran érezte, hogy sikeresen meg tudott küzdeni fontos változásokkal az életében?

25.6. Az elmúlt hónap során milyen gyakran bízott magában, hogy képes megoldani személyes problémáit?

25.7. Az elmúlt hónap során milyen gyakran érezte úgy, hogy a dolgok az Ön kedve szerint alakulnak?

25.8. Az elmúlt hónap során milyen gyakran érezte úgy, hogy nem tud eleget tenni minden kötelezettségének?

25.9. Az elmúlt hónap során milyen gyakran tudta kezelni a bosszúságokat életében?

25.10. Az elmúlt hónap során milyen gyakran érezte úgy, hogy a helyzet magaslatán áll?

25.11. Az elmúlt hónap során milyen gyakran dühítették fel olyan dolgok, amelyeket nem tudott befolyásolni?

25.12. Az elmúlt hónap során milyen gyakran kapta magát azon, hogy az elvégzendő feladatain gondolkozik?

25.13. Az elmúlt hónap során milyen gyakran tudta kézben tartani az időbeosztását?

25.14. Az elmúlt hónap során milyen gyakran érezte úgy, hogy a nehézségek úgy felhalmozódtak, hogy már nem tud úrrá lenni rajtuk?

Köszönöm, hogy válaszolt a kérdéseinkre!