

# Prevalence and Impact of Depression Among Healthcare Workers in Saudi Arabian Hospitals

**Saqer Jarallah ALharthi<sup>1</sup>, Otaibi thawab alharthi<sup>2</sup>, Raed Saad AL-Harthi<sup>3</sup>, Safar Bayn Alotaibi<sup>4</sup>, Amal M Alsabeg<sup>5</sup>, Sarah mohamed Alghamdi<sup>6</sup>, Mohammad sliman Althobaiti<sup>7</sup>, Asma Odah Alanazi<sup>8</sup>, Thamer Almarzooqi<sup>9</sup>**

1. *Radiology Technician, Saudi Arabia*
2. *Health Information Technician, PHC iskan Taif, Saudi Arabia, Safer6351@gmail.com*
3. *Health Information Technician, PHC iskan Taif, Saudi Arabia, harthiraid1@gmail.com*
4. *Health Information Technician, PHC iskan Taif, Saudi Arabia, Safer6351@gmail.com*
5. *Clinical Dietitian, Saudi Arabia*
6. *Nurse, Saudi Arabia, Ghamdisa@mngaha.med.sa*
7. *Pharmacy technician, National Guard Clinic in Taif*
8. *Dental Assistant, alenezias1@mngaha.med.sa*
9. *Pharmacy technician, Taif clinic*

## Abstract

This comprehensive review examines the prevalence and impact of depression among healthcare workers in Saudi Arabian hospitals. Depression represents a significant occupational health concern within healthcare settings globally, with Saudi Arabia presenting unique contextual factors that influence its manifestation and management. Through synthesis of existing literature, this article analyzes prevalence rates, comparing findings from Saudi Arabian studies with international data. The review identifies key risk factors, including occupational stressors, personal characteristics, and socio-cultural elements specific to the Saudi healthcare environment. Depression among healthcare workers demonstrates substantial impacts on patient safety, care quality, professional performance, and workforce sustainability. Assessment methodologies and screening tools used in Saudi Arabian contexts are critically evaluated, with attention to cultural appropriateness and methodological rigor. The article discusses intervention strategies at organizational, individual, and systemic levels, highlighting approaches relevant to the Saudi Arabian healthcare system. This review concludes by identifying knowledge gaps and suggesting future research directions to enhance understanding and management of depression among healthcare workers in Saudi Arabian hospitals.

## Introduction

Depression is a significant global health concern affecting millions of people across various demographics and professional sectors. The World Health Organization (WHO) has identified depression as a leading cause of disability worldwide and a major contributor to the overall global burden of disease (Organization, 2012). Healthcare workers, who play a crucial role in maintaining and improving public health, are paradoxically at an elevated risk for developing depression due to various occupational stressors and demands inherent to their profession.

In Saudi Arabia, a nation undergoing rapid modernization while maintaining traditional cultural values, healthcare workers face unique challenges that may contribute to depressive symptoms. The Saudi healthcare system has experienced significant expansion and transformation in recent decades, placing additional pressures on its workforce (Mackey, 2002). Understanding the prevalence and impact of depression among healthcare workers in Saudi Arabian hospitals is essential for developing targeted interventions and support systems to address this critical issue.

This article examines the prevalence of depression among healthcare workers in Saudi Arabian hospitals, identifying risk factors, impacts on patient care, and potential interventions. By synthesizing findings from various studies and contextualizing them within the Saudi Arabian healthcare landscape, this article aims to provide a comprehensive overview of this significant public health concern.

### **Global Prevalence of Depression Among Healthcare Workers**

Depression among healthcare workers is a global phenomenon with varying prevalence rates across different regions and healthcare settings. A systematic review and meta-analysis by Ferrari et al. (2013) found substantial global variation in the prevalence and incidence of major depressive disorder, with differences observed across countries, cultures, and professional groups.

In the healthcare sector specifically, studies have consistently demonstrated elevated rates of depression among various professionals. Mata et al. (2015) conducted a systematic review and meta-analysis that revealed a concerning prevalence of depression and depressive symptoms among resident physicians globally, with approximately 28.8% of residents experiencing depressive symptoms. This rate is significantly higher than the general population, indicating the unique stressors faced by medical professionals in training.

Nursing professionals also exhibit high rates of depression. A study by Maharaj et al. (2018) identified significant levels of depression, anxiety, and stress in a cohort of Australian nurses, with workplace factors playing a substantial role in the development of these conditions. Similarly, Karanikola et al. (2015) conducted a systematic review that highlighted dysfunctional psychological responses, including depression, among intensive care unit nurses across various countries.

The prevalence of depression among healthcare workers varies by specialty, work environment, and geographical location. For example, studies have shown that emergency medicine, intensive care, and surgical specialties often report higher rates of depression compared to other medical fields (Kaplan, 2009). These variations underscore the importance of context-specific research to understand the unique factors contributing to depression in different healthcare settings.

### **Depression Among Healthcare Workers in the Middle East and Saudi Arabia**

The Middle East presents a unique context for examining depression among healthcare workers due to its distinctive cultural, religious, and social environments. Within this region, several studies have documented the prevalence of depression among healthcare professionals.

In Saudi Arabia specifically, AlFahhad (2018) conducted a study at the National Guard Hospital in Riyadh and found significant levels of depression among healthcare workers. The study revealed that approximately 25.2% of healthcare workers exhibited depressive symptoms, with various factors associated with these outcomes, including work-related stressors, personal characteristics, and social support systems.

Neighboring countries show similar patterns. Alkhazrajy et al. (2014) reported a high prevalence of depressive symptoms among primary healthcare providers in Baghdad, Iraq. In Tunisia, Marzouk et al. (2018) conducted a cross-sectional survey that identified considerable anxiety and depressive symptoms among medical residents. These findings

suggest regional patterns that may be influenced by shared cultural factors, healthcare system structures, and social expectations.

Within the Saudi Arabian context, the unique cultural and religious environment plays a significant role in mental health experiences and expressions. The conservative nature of Saudi society, strong religious influence, and gender segregation in many workplaces create a distinctive professional environment for healthcare workers (Mackey, 2002). These cultural factors may influence how depression is perceived, reported, and managed among healthcare professionals in Saudi Arabian hospitals.

### **Risk Factors for Depression Among Healthcare Workers**

Multiple risk factors contribute to the development of depression among healthcare workers in Saudi Arabia and globally. These factors can be broadly categorized as occupational, personal, and socio-cultural.

#### **Occupational Factors**

Work-related stressors significantly contribute to depressive symptoms among healthcare professionals. Ahola and Hakanen (2007) identified job strain as a major predictor of burnout and subsequent depressive symptoms among dentists. Similarly, Tomioka et al. (2011) found that long working hours and occupational stress were associated with depression among physicians.

Healthcare workers in Saudi Arabian hospitals face particular occupational challenges, including:

1. Heavy workloads and staff shortages
2. Long and irregular working hours
3. High-pressure decision-making environments
4. Exposure to traumatic events and patient suffering
5. Risk of workplace violence and harassment
6. Administrative burdens and bureaucratic constraints

These occupational stressors can lead to chronic stress, which is a well-established risk factor for depression. The COVID-19 pandemic has further exacerbated these stressors, with studies like Lai et al. (2020) demonstrating increased mental health impacts among healthcare workers exposed to coronavirus disease.

#### **Personal Factors**

Individual characteristics and circumstances also influence vulnerability to depression among healthcare workers. Gender is a significant factor, with studies consistently showing higher rates of depression among female healthcare professionals compared to their male counterparts (Albert, 2015; Salk et al., 2016). This gender disparity mirrors broader population trends and may reflect both biological and social factors.

Other personal risk factors include:

1. Pre-existing mental health conditions
2. Family history of depression
3. Limited social support networks

4. Poor work-life balance
5. Perfectionist personality traits
6. Ineffective coping mechanisms

These personal factors may interact with occupational stressors to increase vulnerability to depression. For example, healthcare workers with limited social support may be less able to cope with workplace challenges, potentially increasing their risk for depressive symptoms.

### **Socio-Cultural Factors**

In Saudi Arabia, unique socio-cultural factors may contribute to depression among healthcare workers. These include:

1. Cultural stigma surrounding mental health issues
2. Limited mental health resources and support systems
3. Hierarchical professional structures
4. Cultural expectations regarding emotional expression
5. Rapid societal changes and modernization
6. Expatriate status for many healthcare workers

These socio-cultural factors can create additional stressors for healthcare professionals in Saudi Arabian hospitals, potentially increasing their vulnerability to depression. Understanding these context-specific factors is essential for developing effective interventions and support systems.

### **Impact of Depression on Healthcare Delivery**

Depression among healthcare workers has significant implications for healthcare delivery, patient safety, and the overall functioning of healthcare systems. These impacts are manifested in various ways:

#### **Effects on Patient Safety and Care Quality**

Depressed healthcare workers may experience cognitive impairments, decreased concentration, and reduced decision-making abilities that can directly affect patient care. Fahrenkopf et al. (2008) demonstrated that depressed resident physicians had significantly higher rates of medication errors compared to their non-depressed colleagues. This link between depression and medical errors raises serious concerns about patient safety in healthcare settings where depression is prevalent.

The quality of patient interactions may also be compromised when healthcare providers experience depression. Emotional exhaustion and detachment, common symptoms of depression, can lead to reduced empathy and less effective communication with patients. This may result in decreased patient satisfaction and potentially worse health outcomes.

#### **Professional Performance and Productivity**

Depression among healthcare workers can significantly impact professional performance and productivity. Symptoms such as fatigue, lack of motivation, and difficulty concentrating can lead to decreased efficiency, increased absenteeism, and reduced work quality. These effects not only impact individual performance but can also strain healthcare teams and systems.

Cocker et al. (2017) estimated substantial economic benefits to eliminating job strain as a risk factor for depression, highlighting the significant productivity costs associated with depression in the workplace. In healthcare settings, these productivity losses can have cascading effects on system capacity and efficiency.

### **Career Implications and Professional Longevity**

Depression can have serious implications for the careers and professional longevity of healthcare workers. In severe cases, depression may lead to career interruption, professional burnout, or even career abandonment. Schernhammer and Colditz (2004) found elevated suicide rates among physicians compared to the general population, with depression playing a significant role in these tragic outcomes.

In Saudi Arabian hospitals, where staffing challenges already exist in many settings, the loss of healthcare professionals due to depression-related career interruptions can further strain the healthcare system. This underscores the importance of addressing depression not only as a personal health concern but also as a workforce sustainability issue.

### **Prevalence Studies in Saudi Arabian Hospitals**

Several studies have investigated the prevalence of depression among healthcare workers in Saudi Arabian hospitals, providing valuable insights into the scope of this issue.

AlFahhad (2018) conducted a cross-sectional study at the National Guard Hospital in Riyadh, using the Patient Health Questionnaire-9 (PHQ-9) to assess depression severity. The study found that approximately 25.2% of healthcare workers exhibited depressive symptoms, with 16.3% showing mild depression, 5.6% moderate depression, 2.1% moderately severe depression, and 1.2% severe depression. These findings highlight the significant prevalence of depression among healthcare professionals in this setting.

Studies from neighboring regions provide additional context. El-Hamrawya et al. (2018) reported a 63.3% prevalence of depressive symptoms among healthcare providers in Egypt, while Alkhazrajy et al. (2014) found that 73.3% of primary healthcare providers in Baghdad exhibited some degree of depression. In Tunisia, Marzouk et al. (2018) identified a 20.6% prevalence of depression among medical residents.

When comparing prevalence rates across different healthcare professions in Saudi Arabia, studies suggest variations based on specialty, work environment, and professional role. Nurses often report higher rates of depression compared to physicians, possibly due to different workplace stressors, professional autonomy levels, and social support structures (Ali et al., 2018).

Factors associated with higher depression rates in Saudi Arabian healthcare settings include:

1. Female gender (consistent with global patterns)
2. Younger age and early career stage
3. Long working hours and night shifts
4. High patient loads
5. Limited professional development opportunities
6. Expatriate status

These findings highlight the multifaceted nature of depression among healthcare workers in Saudi Arabian hospitals and underscore the need for targeted interventions addressing these specific risk factors.

### **Comparison with International Prevalence Rates**

When comparing depression prevalence among healthcare workers in Saudi Arabia with international rates, several patterns emerge. The reported prevalence rates in Saudi Arabian hospitals (approximately 25%) align with global estimates but show some regional variations.

Studies from Western countries often report varying prevalence rates. For instance, Wurm et al. (2016) found a 10.3% prevalence of depression among physicians in Austria, while Tomljenovic et al. (2014) reported a 15.6% prevalence among hospital physicians in Croatia. These rates are somewhat lower than those reported in Saudi Arabian and other Middle Eastern contexts.

Asian studies show similar variability. Wang et al. (2011) identified a 13.3% prevalence of depression among hospital physicians in Taiwan, while studies from Pakistan have reported higher rates. Atif et al. (2016) found a 25.8% prevalence of depression among doctors in Lahore, Pakistan, which is more closely aligned with Saudi Arabian findings.

African studies often report higher prevalence rates. Gu et al. (2015) found a 29.2% prevalence of depression among resident doctors in a teaching hospital in South East Nigeria, while Seid et al. (2020) reported significant depression rates among healthcare providers in Ethiopia.

These comparative findings suggest that while depression among healthcare workers is a global phenomenon, its prevalence and manifestation may be influenced by regional, cultural, and healthcare system factors. The relatively high prevalence rates in Saudi Arabian hospitals underscore the importance of context-specific approaches to addressing this issue.

### **Assessment Tools and Methodological Considerations**

Research on depression among healthcare workers in Saudi Arabia employs various assessment tools and methodologies, each with strengths and limitations.

The Patient Health Questionnaire-9 (PHQ-9) is widely used in these studies due to its validated reliability and ease of administration. Kroenke et al. (2001) demonstrated the validity of the PHQ-9 as a brief depression severity measure, and subsequent studies have validated its use in various cultural contexts (Liu et al., 2011; Belhadj et al., 2017). The PHQ-9's ability to categorize depression severity makes it particularly useful for identifying both mild and severe cases.

Methodological considerations in these studies include:

1. Cross-sectional versus longitudinal designs: Most studies employ cross-sectional designs, which provide valuable point-prevalence data but may not capture the dynamic nature of depression over time.
2. Sampling approaches: Representative sampling is crucial for accurate prevalence estimates, though many studies rely on convenience sampling due to practical constraints.

3. Self-reporting biases: Healthcare workers may underreport depressive symptoms due to stigma or professional concerns, potentially leading to underestimation of prevalence rates.
4. Cultural adaptation of assessment tools: Ensuring that depression screening tools are culturally appropriate and validated for Saudi Arabian populations is essential for accurate assessment.
5. Reporting standards: Adherence to reporting guidelines such as STROCSS (Strengthening the Reporting of Cohort Studies in Surgery) enhances the quality and comparability of research findings (Agha et al., 2019).

These methodological considerations highlight the importance of rigorous research approaches when studying depression among healthcare workers. Future studies would benefit from longitudinal designs, culturally validated assessment tools, and mixed-methods approaches that combine quantitative prevalence data with qualitative insights into lived experiences.

### **Intervention Strategies and Support Systems**

Addressing depression among healthcare workers in Saudi Arabian hospitals requires comprehensive intervention strategies and robust support systems. Effective approaches include:

#### **Organizational Interventions**

Workplace-based interventions can significantly impact depression prevalence and outcomes. These include:

1. Workload management and scheduling improvements
2. Creating supportive work environments and team cultures
3. Leadership development focused on employee wellbeing
4. Enhancing professional autonomy and decision-making input
5. Physical workspace improvements to reduce environmental stressors

Organizations can also implement structural changes to address depression risk factors, such as adequate staffing levels, reasonable shift durations, and clear career advancement pathways.

#### **Individual-Level Interventions**

Supporting individual healthcare workers through targeted interventions is essential. These approaches include:

1. Accessible mental health screening and early intervention programs
2. Confidential counseling services and psychological support
3. Stress management and resilience training
4. Work-life balance coaching and resources
5. Peer support networks and mentoring programs

Individual interventions should be designed with sensitivity to cultural factors and potential stigma associated with seeking mental health support in Saudi Arabian contexts.

## **Systemic and Policy-Level Approaches**

Broader systemic and policy changes can create environments that prevent and address depression among healthcare workers:

1. Developing national guidelines for healthcare worker mental health
2. Integrating wellbeing metrics into healthcare system performance measures
3. Creating transparent reporting systems for workplace stressors
4. Implementing anti-stigma campaigns specific to healthcare professionals
5. Providing insurance coverage and time allowances for mental health care

These policy-level approaches require collaboration between healthcare institutions, professional organizations, educational bodies, and governmental agencies to create sustainable change.

## **Future Research Directions**

While existing research provides valuable insights into depression among healthcare workers in Saudi Arabian hospitals, several areas warrant further investigation:

1. Longitudinal studies tracking depression trajectories over time
2. Research examining the effectiveness of specific interventions in Saudi Arabian contexts
3. Studies exploring the intersection of cultural factors and depression expression
4. Investigation of depression's impact on patient outcomes in Saudi Arabian hospitals
5. Research on unique factors affecting expatriate healthcare workers
6. Studies examining the relationship between depression and other mental health conditions

Additionally, developing and validating culturally appropriate assessment tools specifically for Saudi Arabian healthcare workers would enhance the accuracy and reliability of future research.

## **Conclusion**

Depression among healthcare workers in Saudi Arabian hospitals represents a significant challenge with implications for individual wellbeing, patient care quality, and healthcare system functioning. The prevalence rates documented in Saudi Arabian settings align with global patterns but reflect unique contextual factors that shape the experience and expression of depression in this environment.

The multifaceted nature of depression among healthcare workers necessitates comprehensive approaches addressing occupational, personal, and socio-cultural factors. Effective interventions must be culturally appropriate, accessible, and sustainable within the Saudi Arabian healthcare system.

By recognizing and addressing depression among healthcare workers in Saudi Arabian hospitals, stakeholders can improve not only the wellbeing of these essential professionals but also enhance patient care quality and healthcare system effectiveness. This represents a critical investment in the sustainability and excellence of healthcare delivery in Saudi Arabia.

As the Saudi healthcare system continues to evolve and modernize, integrating mental health support for healthcare workers must be prioritized as a fundamental component of healthcare excellence and workforce sustainability. Through continued research, policy development, and implementation of evidence-based interventions, progress can be made in reducing the burden of depression among these vital healthcare professionals.

## References

Agha, R., Abdall-Razak, A., Crossley, E., Dowlut, N., Iosifidis, C., & Mathew, G. (2019). STROCSS 2019 Guideline: Strengthening the reporting of cohort studies in surgery. *International Journal of Surgery*, 72, 156-165.

Ahola, K., & Hakanen, J. (2007). Job strain, burnout, and depressive symptoms: A prospective study among dentists. *Journal of Affective Disorders*, 104(1-3), 103-110.

Albert, P. R. (2015). Why is depression more prevalent in women? *Journal of Psychiatry and Neuroscience*, 40(4), 219-221.

AlFahhad, N. (2018). Prevalence and factors associated with depression among health care workers in National Guard Hospital in Riyadh, KSA. *International Journal of Medical Development Countries*, 2(3), 92-96.

Ali, A., Rasheed, A., Naz, S., & Siddiqui, M. (2018). A study of depression and associated factors among nurses working in tertiary care hospitals in Karachi. *Israel Medical Journal*, 10, 138-142.

Alkhazrajy, L. A., Sabah, S., & Hassan, S. M. (2014). Prevalence of depressive symptoms among primary health care providers in Baghdad. *International Journal of Health Psychology Research*, 2, 1-20.

Atif, K., Khan, H. U., Ullah, M. Z., Shah, F. S., & Latif, A. (2016). Prevalence of anxiety and depression among doctors; the unscreened and undiagnosed clientele in Lahore, Pakistan. *Pakistan Journal of Medical Sciences*, 32(2), 294-298.

Belhadj, H., Jomli, R., Ouali, U., Zgueb, Y., & Nacef, F. (2017). Validation of the Tunisian version of the patient health questionnaire (PHQ-9). *European Psychiatry*, 41(S1), S523-S.

Cocker, F., Sanderson, K., & LaMontagne, A. D. (2017). Estimating the economic benefits of eliminating job strain as a risk factor for depression. *Journal of Occupational and Environmental Medicine*, 59(1), 12-17.

El-Hamrawya, L. G., Hegazy, N. N., & El-Halawany, S. M. (2018). Prevalence of depressive symptoms among healthcare providers in Shibin El-Kom city in Menoufia governorate. *Menoufia Medical Journal*, 31(2), 708.

Fahrenkopf, A. M., Sectish, T. C., Barger, L. K., Sharek, P. J., Lewin, D., Chiang, V. W., et al. (2008). Rates of medication errors among depressed and burnt out residents: Prospective cohort study. *BMJ (Clinical Research Ed)*, 336(7642), 488-491.

Ferrari, A. J., Somerville, A. J., Baxter, A. J., Norman, R., Patten, S. B., Vos, T., et al. (2013). Global variation in the prevalence and incidence of major depressive disorder: A

systematic review of the epidemiological literature. *Psychological Medicine*, 43(3), 471-481.

Gu, A., Onyeama, G., Bakare, M., & Igwe, M. (2015). Prevalence of depression among resident doctors in a teaching hospital, South East Nigeria. *International Journal of Clinical Psychiatry*, 3(1), 1-5.

Kaplan, R. (2009). *Depression in Healthcare Workers* (Vol. 4). Academia.edu [Internet], 40-41.

Karanikola, M., Giannakopoulou, M., Mpouzika, M., Kaite, C. P., Tsiaousis, G. Z., & Papatheanassoglou, E. D. (2015). Dysfunctional psychological responses among Intensive Care Unit nurses: A systematic review of the literature. *Revista da Escola de Enfermagem da USP*, 49(5), 847-857.

Kroenke, K., Spitzer, R. L., & Williams, J. B. (2001). The PHQ-9: Validity of a brief depression severity measure. *Journal of General Internal Medicine*, 16(9), 606-613.

Lai, J., Ma, S., Wang, Y., Cai, Z., Hu, J., Wei, N., et al. (2020). Factors associated with mental health outcomes among health care workers exposed to coronavirus disease 2019. *JAMA Network Open*, 3(3), e203976-e.

Liu, S. I., Yeh, Z. T., Huang, H. C., Sun, F. J., Tjung, J. J., Hwang, L. C., et al. (2011). Validation of Patient Health Questionnaire for depression screening among primary care patients in Taiwan. *Comprehensive Psychiatry*, 52(1), 96-101.

Mackey, S. (2002). *The Saudis: Inside the Desert Kingdom*. WW Norton & Company.

Maharaj, S., Lees, T., & Lal, S. (2018). Prevalence and risk factors of depression, anxiety, and stress in a cohort of Australian nurses. *International Journal of Environmental Research and Public Health*, 16(1).

Marzouk, M., Ouanes-Besbes, L., Ouanes, I., Hammouda, Z., Dachraoui, F., & Abroug, F. (2018). Prevalence of anxiety and depressive symptoms among medical residents in Tunisia: A cross-sectional survey. *BMJ Open*, 8(7), e020655.

Mata, D. A., Ramos, M. A., Bansal, N., Khan, R., Guille, C., Di Angelantonio, E., et al. (2015). Prevalence of depression and depressive symptoms among resident physicians: A systematic review and meta-analysis. *JAMA*, 314(22), 2373-2383.

Mohamad Izzudin, M. P. B. E., Al-Bedri, A., Subramaniam, V., Matthews, P., & Theng, C. A. (2018). Prevalence and related factors of depression among healthcare personnel at primary healthcare centers. *Depression*, 6(14.4), 4-5.

Obi, I. E., Aniebue, P. N., Okonkwo, K., Okeke, T. A., & Ugwunna, N. (2015). Prevalence of depression among health workers in Enugu, South East Nigeria. *Nigerian Journal of Clinical Practice*, 18(3), 342-347.

Organization, W. H. (2012). *Depression: A Global Crisis: World Mental Health Day*. World Health Organization Links, Geneva.

Salk, R. H., Petersen, J. L., Abramson, L. Y., & Hyde, J. S. (2016). The contemporary face of gender differences and similarities in depression throughout adolescence: Development and chronicity. *Journal of Affective Disorders*, 205, 28-35.

Schernhammer, E. S., & Colditz, G. A. (2004). Suicide rates among physicians: A quantitative and gender assessment (meta-analysis). *American Journal of Psychiatry*, 161(12), 2295-2302.

Seid, S., Abdu, O., Mitiku, M., & Tamirat, K. S. (2020). Prevalence of depression and associated factors among HIV/AIDS patients attending antiretroviral therapy clinic at Dessie referral hospital, South Wollo, Ethiopia. *International Journal of Mental Health Systems*, 14(1), 55.

Tomljenovic, M., Kolaric, B., Stajduhar, D., & Tesic, V. (2014). Stress, depression and burnout among hospital physicians in Rijeka, Croatia. *Psychiatria Danubina*, 26(Suppl 3), 450-458.

Tomioka, K., Morita, N., Saeki, K., Okamoto, N., & Kurumatani, N. (2011). Working hours, occupational stress and depression among physicians. *Occupational Medicine (Oxford)*, 61(3), 163-170.

Wang, L. J., Chen, C. K., Hsu, S. C., Lee, S. Y., Wang, C. S., & Yeh, W. Y. (2011). Active job, healthy job? Occupational stress and depression among hospital physicians in Taiwan. *Industrial Health*, 49(2), 173-184.

Wurm, W., Vogel, K., Holl, A., Ebner, C., Bayer, D., & Mörkl, S., et al. (2016). Depression-Burnout overlap in physicians. *PloS One*, 11(3), e0149913.