



The Effectiveness of Resilience Training on Burnout, Coping Strategies, and Quality of Life Among Healthcare Workers

Reem. Al-Sabah¹, Hossein. Rostami^{2*}

¹ Department of Psychology, Kuwait University, Kuwait City, Kuwait

² Department of Sports Psychology, Kharazmi University, Tehran, Iran

* Corresponding author email address: h.rostami@khu.ac.ir

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ABSTRACT

Objective: This study aimed to determine the effectiveness of resilience training on burnout, coping strategies, and quality of life among healthcare workers in Tehran.

Methods and Materials: This study was conducted using a quasi-experimental design with a pre-test, post-test, and one-month follow-up with a control group. The statistical population included healthcare workers employed in hospitals and healthcare centers in Tehran, Iran. A total of 60 healthcare workers were selected through purposive sampling based on the inclusion and exclusion criteria and were randomly assigned to an experimental group and a control group, with 30 participants in each group. The experimental group received resilience training in eight weekly 90-minute sessions, while the control group received no psychological intervention during the same period. Data were collected using the Maslach Burnout Inventory-Human Services Survey, the Brief COPE Inventory, and the World Health Organization Quality of Life-BREF questionnaire. Data were analyzed using descriptive statistics, assumption tests, repeated-measures analysis of variance, and Bonferroni post hoc comparisons.

Findings: The inferential results showed significant time-by-group interaction effects for burnout, adaptive coping strategies, maladaptive coping strategies, and quality of life. Resilience training significantly reduced burnout in the experimental group compared with the control group ($F = 73.65, p < 0.001, \eta^2 = 0.559$). The intervention also significantly increased adaptive coping strategies ($F = 64.09, p < 0.001, \eta^2 = 0.525$) and significantly reduced maladaptive coping strategies ($F = 38.97, p < 0.001, \eta^2 = 0.402$). In addition, resilience training significantly improved quality of life among healthcare workers in the experimental group compared with the control group ($F = 61.31, p < 0.001, \eta^2 = 0.514$). Bonferroni post hoc comparisons confirmed significant improvements from pre-test to post-test and from pre-test to follow-up, while post-test to follow-up differences were not significant.

Conclusion: The findings indicated that resilience training is an effective psychological intervention for reducing burnout, improving coping strategies, and enhancing quality of life among healthcare workers. Therefore, resilience training can be integrated into occupational health and staff well-being programs in healthcare settings.

Keywords: Resilience Training; Burnout; Coping Strategies; Quality of Life; Healthcare Workers.

1. Introduction

Healthcare workers constitute one of the most essential professional groups in every health system, because the continuity, safety, and quality of patient care depend not only on their technical competence but also on their psychological capacity to function under persistent pressure. In clinical settings, healthcare workers are repeatedly exposed to high workload, emotional demands, unpredictable patient needs, moral distress, interpersonal tension, shift work, sleep disruption, and organizational constraints. These conditions create a work environment in which psychological strain may gradually accumulate and affect professional performance, mental health, interpersonal functioning, and quality of life. The COVID-19 pandemic intensified this concern and revealed that healthcare workers may experience considerable psychological distress when occupational demands exceed available personal and institutional resources (Heath et al., 2020; Maunder et al., 2021). Studies conducted during and after the pandemic have shown that burnout and psychological burden among healthcare workers are not temporary or isolated problems but persistent occupational health issues that require systematic prevention and intervention (Khubchandani et al., 2024; Lazarides et al., 2021). Therefore, protecting the psychological health of healthcare workers has become a central priority for health systems, not only for the well-being of professionals themselves but also for the safety and effectiveness of healthcare delivery (Bhadoria et al., 2025).

Burnout is one of the most important psychological consequences of chronic occupational stress in healthcare settings. It is generally characterized by emotional exhaustion, depersonalization or emotional distancing from patients, and reduced personal accomplishment. Among clinicians and healthcare professionals, burnout can manifest as persistent fatigue, diminished empathy, reduced work engagement, irritability, lower perceived competence, and a sense of detachment from the meaning of professional work (Chandawarkar & Chaparro, 2021). The significance of burnout is not limited to individual discomfort, because it can influence patient care, communication, decision-making, professional satisfaction, absenteeism, turnover intentions, and the sustainability of the healthcare workforce (Johnson et al., 2021). Recent evidence has continued to report high levels of burnout among medical trainees and healthcare workers in different settings, suggesting that the problem is widespread across specialties, career stages, and

healthcare systems (Alzain et al., 2024; Baxter et al., 2025). The hidden costs of medical training and clinical work include psychological exhaustion, weakened professional identity, and reduced well-being, all of which can compromise both personal and organizational outcomes (Jerjes & Majeed, 2025). Similar patterns have been observed among other healthcare-related professional groups, including psychological therapy trainees and veterinarians, indicating that burnout is a cross-disciplinary phenomenon associated with emotionally demanding service work (Owen et al., 2021; Steffey et al., 2023).

Although burnout is often discussed as an individual psychological outcome, it emerges from the interaction between personal, occupational, and organizational factors. Excessive workload, time pressure, insufficient staffing, limited autonomy, administrative burden, inadequate supervision, poor team communication, and lack of recognition may increase vulnerability to burnout. At the same time, individual resources such as emotional regulation, self-efficacy, meaning-making, social support, coping skills, and resilience may influence how healthcare workers respond to occupational stress. Resilience has therefore received increasing attention as a protective factor in healthcare settings. In general, resilience refers to the capacity to adapt, recover, and maintain psychological functioning in the face of adversity, pressure, uncertainty, or prolonged stress. In healthcare providers, resilience includes the ability to regulate emotions, maintain professional purpose, seek support, use adaptive coping strategies, preserve hope, and continue functioning effectively despite difficult clinical circumstances (Sheikhrabari et al., 2022). Research has shown that resilience is closely associated with perceived stress and emotional intelligence among healthcare professionals, suggesting that resilient workers may be better able to understand, regulate, and respond to emotionally demanding situations (Duică et al., 2024). Resilience is also relevant to readiness to practice, especially among healthcare workers who face additional social, educational, or structural challenges in their professional development (Hussein et al., 2025).

The relationship between stress, coping, and quality of life among healthcare workers further demonstrates the importance of resilience-based interventions. Healthcare workers do not respond to stress in a uniform manner; rather, their outcomes depend partly on the coping strategies they use. Adaptive coping strategies, such as problem-solving, planning, positive reframing, acceptance, help-seeking, emotional regulation, and constructive communication, can

reduce the negative impact of stress and support psychological functioning. In contrast, maladaptive coping strategies, such as avoidance, denial, withdrawal, self-blame, and disengagement, may intensify distress and contribute to burnout. Evidence from shift-working healthcare professionals indicates that self-regulation may mediate the relationship between stress and quality of life, highlighting the role of behavioral and cognitive control mechanisms in occupational well-being (Mohammed et al., 2025). Studies among health profession students have also shown that resilience is related to distress responses under stressful conditions, including pandemic-related uncertainty and exposure to threatening information (Yu et al., 2021). In addition, professional identity has been linked to psychosocial factors among physicians in standardized training programs, suggesting that the way healthcare workers understand their professional role may be connected to resilience, coping, and well-being (Zeng et al., 2024).

Coping strategies are particularly important because they represent modifiable psychological processes that can be strengthened through training. Resilience training may improve coping by helping participants identify stress triggers, challenge unhelpful cognitive appraisals, regulate emotional reactions, communicate needs more effectively, use social support, and maintain purposeful engagement with work. Mindfulness-based and compassion-based programs have shown promising effects in medical education and healthcare settings by promoting self-awareness, emotional balance, and compassionate responses to stress (Wong et al., 2025). Practical mindfulness modules designed to reduce physician burnout further support the idea that brief, structured psychological programs can be integrated into professional development contexts (Pouramin et al., 2025). Similarly, online mindfulness training for hospital doctors during the pandemic has been associated with resilience and coping outcomes, indicating that structured psychological education may be useful even under highly demanding clinical conditions (Hanson et al., 2022). Resilience curricula in medical education have also been systematically examined as a strategy for addressing physician burnout, although the literature emphasizes that such programs should be theory-based, practical, and responsive to workplace realities (Seo et al., 2021).

The importance of resilience training is further supported by the growing emphasis on primary prevention. Rather than waiting until healthcare workers develop severe burnout or psychiatric symptoms, preventive approaches aim to strengthen protective attributes, roles, and social networks

before occupational strain becomes disabling (Naughton et al., 2025). Institutional wellness initiatives have similarly emphasized self-care, supportive environments, and organizational responsibility in promoting well-being among students and professionals in health-related fields (Morgan, 2021). During the pandemic, psychiatric education and clinical training programs were forced to adapt to new educational and emotional challenges, demonstrating the need for flexible systems that can support both learning and psychological safety (Schwartz & Brenner, 2021). Practical strategies to remain healthy and fit during demanding residency training also show that occupational well-being requires deliberate attention to routines, habits, support systems, and coping behaviors (Chhabra et al., 2022). In this regard, resilience training can be viewed as a structured attempt to strengthen personal resources while also encouraging more adaptive patterns of occupational functioning.

Quality of life is another essential outcome in studies of healthcare worker well-being. While burnout reflects occupational exhaustion and coping strategies reflect stress-response patterns, quality of life captures a broader perception of physical, psychological, social, and environmental well-being. Healthcare workers with low quality of life may experience fatigue, poor sleep, emotional distress, reduced social functioning, dissatisfaction with work-life balance, and diminished personal fulfillment. Such impairments may not only reduce personal well-being but also influence patient care and professional commitment. The connection between stress, self-regulation, and quality of life among shift-working healthcare professionals suggests that interventions targeting internal regulatory capacities may have broader effects beyond burnout reduction (Mohammed et al., 2025). Moreover, the literature on physician suicide risk, psychiatric comorbidities, judicial pressure, and burnout demonstrates that poor occupational well-being can become part of a more serious chain of psychological risk when healthcare workers do not receive timely support (Duarte et al., 2023). Therefore, interventions aimed at improving quality of life among healthcare workers should address emotional, cognitive, behavioral, and relational dimensions of occupational functioning.

At the intervention level, contemporary research increasingly recommends both individual and organizational strategies for managing work-related stress in healthcare professionals. Systematic evidence suggests that workplace stress cannot be adequately addressed through a single approach, because burnout is shaped by both individual

vulnerability and organizational conditions (Catapano et al., 2023). Reviews of workplace interventions for health and social service workers have also indicated that programs designed to improve health and well-being may be beneficial when they are structured, relevant to professional demands, and implemented in a supportive context (Shiri et al., 2023). Lessons from health workforce well-being initiatives emphasize the need for feasible, scalable, and contextually appropriate programs that can be integrated into healthcare organizations (Dent et al., 2024). Department-wide initiatives such as well-being and resilience programs in pediatrics further show that resilience promotion can be implemented across students, staff, and faculty when institutions recognize well-being as a shared responsibility (Hart et al., 2023). Similarly, programs designed to improve healthcare team communication highlight the role of interpersonal skills, reflective practice, and team-based learning in strengthening the work environment (Preis et al., 2022).

Coaching and professional support are also important components of resilience-oriented practice. Evaluation of coaching workshops among medical trainees has suggested that structured reflection, peer discussion, and skills-based support may help trainees manage professional demands more effectively (Al-Ghunaim et al., 2023). Career-long supervision has likewise been described as a mechanism for developing resilient practitioners, particularly in professions where workers must regularly manage emotionally complex interactions and ethical responsibilities (McEwen et al., 2025). These findings suggest that resilience is not a fixed personal trait but a developable capacity that can be supported through training, supervision, reflection, and organizational culture. Multi-level approaches to surgeon burnout further emphasize that individual resilience programs are most effective when combined with broader attention to professional norms, leadership, workload, and institutional responsibility (Golisch et al., 2023). At the same time, comprehensive reviews of burnout mitigation strategies have highlighted the value of interventions that combine psychological education, coping skills, self-care, communication, and workplace support (Naeeni & Nouhi, 2023). Psychological approaches to preventing burnout in health professionals specifically identify resilience-building as a promising pathway for reducing emotional exhaustion and strengthening adaptive functioning (Golparvar & Parsakia, 2023).

Despite the growing body of evidence on burnout, resilience, and healthcare worker well-being, several gaps

remain. First, many studies have examined burnout prevalence or correlates, while fewer have tested structured resilience training programs using a pre-test, post-test, and follow-up design. Second, intervention studies often focus on burnout alone, whereas healthcare worker well-being is multidimensional and includes coping strategies and quality of life. Third, the relationship between resilience training and both adaptive and maladaptive coping patterns requires further empirical attention, because changes in coping may partly explain how resilience-based programs reduce burnout and improve broader well-being. Fourth, healthcare systems differ across social and cultural contexts, and findings from one setting cannot automatically be generalized to another. In Tehran, healthcare workers face demanding clinical responsibilities, high patient volume, organizational pressure, and complex emotional interactions, making it important to evaluate practical interventions that may strengthen their psychological resources. Therefore, examining the effectiveness of resilience training among healthcare workers in Tehran can provide useful evidence for occupational health, psychological intervention, and workforce well-being programs.

The aim of this study was to determine the effectiveness of resilience training on burnout, coping strategies, and quality of life among healthcare workers in Tehran.

2. Methods and Materials

2.1. Study Design and Participants

This study was conducted using a quasi-experimental design with a pre-test, post-test, and follow-up assessment with a control group. The statistical population consisted of healthcare workers employed in public hospitals and healthcare centers in Tehran, Iran. From this population, 60 healthcare workers were selected through purposive sampling based on the inclusion and exclusion criteria and were then randomly assigned to an experimental group and a control group, with 30 participants in each group. The inclusion criteria were employment as a healthcare worker in clinical or health-service settings, having at least one year of work experience, willingness to participate in the study, and providing informed consent. Participants were also required to have no concurrent participation in other psychological or resilience-based training programs during the study period. The exclusion criteria included absence from more than two intervention sessions, incomplete questionnaire responses, withdrawal of consent, or

experiencing an acute psychological or occupational crisis during the intervention period that could interfere with participation. The experimental group received resilience training in eight weekly sessions, each lasting approximately 90 minutes, while the control group received no psychological intervention during the same period and continued their routine occupational activities. The resilience training program focused on strengthening adaptive coping resources, emotional regulation, cognitive flexibility, problem-solving skills, optimism, meaning-making, interpersonal support, and stress-management strategies in the workplace. The post-test assessment was conducted immediately after the completion of the intervention, and the follow-up assessment was conducted one month later to evaluate the stability of the intervention effects.

2.2. Measures

Burnout was assessed using the Maslach Burnout Inventory-Human Services Survey, developed by Maslach and Jackson in 1981. This instrument is one of the most widely used tools for measuring occupational burnout, particularly among professionals working in healthcare, education, and human-service settings. The questionnaire consists of 22 items and measures three dimensions of burnout: emotional exhaustion, depersonalization, and reduced personal accomplishment. Items are scored on a Likert-type scale based on the frequency of burnout-related experiences, with higher scores in emotional exhaustion and depersonalization indicating greater burnout, while lower scores in personal accomplishment reflect a higher level of burnout in that dimension. The emotional exhaustion subscale evaluates feelings of being emotionally overextended and depleted by work demands; the depersonalization subscale assesses impersonal, detached, or negative responses toward patients or service recipients; and the personal accomplishment subscale measures perceived competence and successful achievement in work-related roles. The validity and reliability of the Maslach Burnout Inventory have been confirmed in numerous studies across healthcare populations, and previous research has reported acceptable internal consistency coefficients for its subscales.

Coping strategies were measured using the Brief COPE Inventory, developed by Carver in 1997 as a shortened version of the original COPE inventory. The Brief COPE consists of 28 items and evaluates a broad range of cognitive and behavioral coping responses used when individuals

encounter stressful situations. The instrument includes several coping dimensions, such as active coping, planning, positive reframing, acceptance, emotional support, instrumental support, self-distraction, denial, venting, behavioral disengagement, self-blame, humor, religion, and substance use. Each item is scored on a four-point Likert scale ranging from low use to high use of the coping strategy. In the present study, the coping strategies were interpreted in terms of adaptive and maladaptive coping patterns, with higher scores in active coping, planning, acceptance, positive reframing, and support-seeking reflecting more constructive coping, and higher scores in denial, behavioral disengagement, self-blame, and substance use reflecting less adaptive coping. The Brief COPE has been widely used in occupational health and clinical research, and its validity and reliability have been confirmed in previous studies involving healthcare workers and other stress-exposed populations.

Quality of life was assessed using the World Health Organization Quality of Life-BREF questionnaire, developed by the World Health Organization Quality of Life Group in 1996. This questionnaire is a short form of the WHOQOL-100 and consists of 26 items that measure individuals' perceived quality of life across four main domains: physical health, psychological health, social relationships, and environmental health. The physical health domain assesses areas such as energy, fatigue, pain, sleep, mobility, daily activities, and work capacity. The psychological health domain evaluates positive and negative feelings, self-esteem, thinking, learning, memory, concentration, and body image. The social relationships domain includes personal relationships, social support, and sexual activity, while the environmental domain assesses financial resources, safety, access to health services, opportunities for acquiring information and skills, recreation, physical environment, and transportation. Items are scored on a five-point Likert scale, and higher scores indicate better perceived quality of life. The WHOQOL-BREF has demonstrated acceptable psychometric properties in different cultural and occupational groups, and previous studies have confirmed its validity and reliability for assessing quality of life among healthcare workers and adult populations.

2.3. Intervention

The resilience training protocol was implemented for the experimental group in eight weekly sessions, each lasting approximately 90 minutes, while the control group received

no intervention during the same period. The program was designed to strengthen psychological resilience and adaptive functioning among healthcare workers by focusing on awareness of occupational stress, emotional regulation, cognitive restructuring, problem-solving, adaptive coping, interpersonal support, optimism, meaning-making, and self-care. In the first session, participants were introduced to the concept of resilience, occupational burnout, and the relationship between stress, coping, and quality of life in healthcare settings. The second session focused on recognizing personal stress responses, identifying burnout symptoms, and increasing awareness of emotional and bodily reactions to workplace pressure. The third session addressed cognitive flexibility and helped participants identify irrational or unhelpful thoughts, replace them with balanced interpretations, and develop more constructive appraisals of stressful events. The fourth session focused on emotional regulation skills, including relaxation, breathing exercises, mindfulness of emotions, and strategies for managing anger, anxiety, and emotional exhaustion. The fifth session emphasized problem-solving and decision-making skills in difficult clinical and organizational situations. The sixth session focused on strengthening adaptive coping strategies, reducing avoidance and self-blame, and increasing acceptance, planning, positive reframing, and help-seeking behaviors. The seventh session addressed interpersonal resilience through communication skills, assertiveness, peer support, empathy, and effective use of social and professional support systems. The final session reviewed the learned skills, encouraged participants to develop a personal resilience plan, discussed strategies for maintaining gains after the intervention, and provided exercises for applying resilience skills in daily occupational situations.

2.4. Data Analysis

Data were analyzed using SPSS statistical software. Before conducting inferential analyses, the accuracy of data entry, missing values, outliers, and distributional characteristics of the variables were examined. Descriptive statistics, including mean and standard deviation, were used to describe the study variables in the experimental and control groups across the pre-test, post-test, and follow-up stages. The normality of the distribution of the dependent variables was assessed using the Shapiro-Wilk test, and the homogeneity of variances was examined using Levene's test. The assumption of equality of covariance matrices was

evaluated using Box's M test, and the sphericity assumption for repeated measurements was examined using Mauchly's test. When the sphericity assumption was violated, the Greenhouse-Geisser correction was applied. To evaluate the effectiveness of resilience training on burnout, coping strategies, and quality of life, repeated-measures analysis of variance was used to examine the effects of time, group, and the time-by-group interaction. When significant interaction effects were observed, Bonferroni post hoc comparisons were conducted to determine differences between pre-test, post-test, and follow-up scores within each group. The significance level was set at 0.05 for all statistical tests. Effect sizes were reported using partial eta squared to determine the magnitude of the intervention effect. The analysis was conducted to determine whether participation in resilience training led to significant reductions in burnout, improvements in adaptive coping strategies, reductions in maladaptive coping strategies, and enhancement of quality of life among healthcare workers compared with the control group.

3. Findings and Results

The study was conducted on 60 healthcare workers employed in hospitals and healthcare centers in Tehran, Iran. Participants were randomly assigned to the experimental group and the control group, with 30 participants in each group. The demographic findings showed that the mean age of participants in the experimental group was 34.53 years with a standard deviation of 6.18, while the mean age of participants in the control group was 34.91 years with a standard deviation of 6.70. The independent samples t-test indicated that there was no statistically significant difference between the two groups in terms of age, suggesting that the groups were homogeneous with respect to this demographic variable. In terms of gender distribution, 38 participants were female and 22 participants were male. In the experimental group, 19 participants were female and 11 were male, while in the control group, 19 participants were female and 11 were male. The chi-square test showed no significant difference between the two groups regarding gender distribution. Regarding marital status, 39 participants were married and 21 were single. In the experimental group, 20 participants were married and 10 were single, while in the control group, 19 participants were married and 11 were single. This difference was not statistically significant. With regard to educational level, 41 participants had a bachelor's degree and 19 participants had a master's degree or higher.

In terms of occupational role, the sample included nurses, physicians, laboratory and radiology staff, midwives, and other clinical healthcare personnel. The mean work experience of participants was 9.18 years with a standard deviation of 5.27. The mean work experience was 9.06 years in the experimental group and 9.31 years in the control group, and the difference between the two groups was not statistically significant. Overall, the demographic results

indicated that the experimental and control groups were comparable in terms of age, gender, marital status, educational level, occupational role, and work experience before the intervention. Therefore, any differences observed in burnout, coping strategies, and quality of life after the intervention could be more confidently attributed to the resilience training program rather than to demographic differences between the groups.

Table 1

Descriptive statistics of burnout, coping strategies, and quality of life in the experimental and control groups across pre-test, post-test, and follow-up

Variable	Group	Pre-test Mean ± SD	Post-test Mean ± SD	Follow-up Mean ± SD
Burnout	Experimental	67.84 ± 8.91	51.26 ± 7.84	52.10 ± 8.03
Burnout	Control	66.93 ± 9.16	65.72 ± 8.75	66.21 ± 8.94
Adaptive coping strategies	Experimental	42.13 ± 6.05	55.47 ± 6.22	54.86 ± 6.30
Adaptive coping strategies	Control	41.76 ± 6.44	42.58 ± 6.12	42.04 ± 6.29
Maladaptive coping strategies	Experimental	34.52 ± 5.71	26.40 ± 5.22	27.06 ± 5.34
Maladaptive coping strategies	Control	35.01 ± 5.94	34.57 ± 5.88	34.80 ± 5.67
Quality of life	Experimental	72.85 ± 9.70	88.64 ± 10.21	87.90 ± 9.98
Quality of life	Control	73.11 ± 10.02	74.20 ± 9.60	73.62 ± 9.78

As shown in Table 1, the pre-test mean scores of burnout, adaptive coping strategies, maladaptive coping strategies, and quality of life were relatively similar in the experimental and control groups before the implementation of the intervention. This similarity indicates that the two groups were comparable at baseline in terms of the main study variables. After the resilience training program, the experimental group showed a clear reduction in burnout, with the mean score decreasing from 67.84 at pre-test to 51.26 at post-test. This reduction was largely maintained at follow-up, with a mean score of 52.10, suggesting that the beneficial effect of resilience training on burnout remained relatively stable one month after the intervention. In contrast, the control group showed only minimal changes in burnout scores across the three measurement stages, with mean scores of 66.93 at pre-test, 65.72 at post-test, and 66.21 at follow-up. Regarding adaptive coping strategies, the experimental group showed a considerable increase from 42.13 at pre-test to 55.47 at post-test, and this improvement was maintained at follow-up with a mean score of 54.86. The control group showed no meaningful improvement in adaptive coping strategies, with mean scores remaining close across the three stages. For maladaptive coping strategies, the experimental group showed a noticeable decrease from 34.52 at pre-test to 26.40 at post-test, with a follow-up mean of 27.06, indicating that resilience training helped

participants reduce less adaptive responses to occupational stress. In comparison, the control group showed almost no change in maladaptive coping strategies. Finally, the mean quality of life score in the experimental group increased from 72.85 at pre-test to 88.64 at post-test and remained high at follow-up with a mean of 87.90. The control group showed only a slight and unstable change in quality of life. Overall, the descriptive findings suggest that resilience training was associated with reduced burnout, increased adaptive coping, decreased maladaptive coping, and improved quality of life among healthcare workers in the experimental group.

Before conducting repeated-measures analysis of variance, the main statistical assumptions were examined. The Shapiro-Wilk test showed that the distributions of burnout, adaptive coping strategies, maladaptive coping strategies, and quality of life scores were normal in both groups across the pre-test, post-test, and follow-up stages. The significance levels of the Shapiro-Wilk tests were greater than 0.05 for all variables, indicating that the assumption of normality was met. Levene’s test also confirmed the homogeneity of error variances for all dependent variables at the three measurement stages. In addition, Box’s M test showed that the equality of covariance matrices was not violated. Mauchly’s test of sphericity was examined for the repeated-measures factor.

Where the sphericity assumption was not violated, the standard repeated-measures results were interpreted; where necessary, the Greenhouse-Geisser correction was

considered. Based on these preliminary analyses, the data were suitable for repeated-measures analysis of variance.

Table 2

Results of repeated-measures analysis of variance for the effects of time, group, and time-by-group interaction

Variable	Effect	F	p-value	Partial eta squared
Burnout	Time	88.42	<0.001	0.604
Burnout	Group	22.73	<0.001	0.282
Burnout	Time × Group	73.65	<0.001	0.559
Adaptive coping strategies	Time	71.18	<0.001	0.551
Adaptive coping strategies	Group	29.42	<0.001	0.337
Adaptive coping strategies	Time × Group	64.09	<0.001	0.525
Maladaptive coping strategies	Time	43.56	<0.001	0.429
Maladaptive coping strategies	Group	18.62	<0.001	0.243
Maladaptive coping strategies	Time × Group	38.97	<0.001	0.402
Quality of life	Time	67.84	<0.001	0.539
Quality of life	Group	23.55	<0.001	0.289
Quality of life	Time × Group	61.31	<0.001	0.514

The results presented in Table 2 indicate that the main effect of time was statistically significant for burnout, adaptive coping strategies, maladaptive coping strategies, and quality of life. This means that the scores of the study variables changed significantly across the pre-test, post-test, and follow-up stages. However, the more important result for evaluating the effectiveness of the intervention is the time-by-group interaction effect. The findings showed that the interaction between time and group was statistically significant for all dependent variables. For burnout, the significant time-by-group interaction indicated that the reduction in burnout over time was different between the experimental and control groups. Specifically, burnout decreased substantially in the experimental group after resilience training, whereas the control group showed no meaningful reduction. The partial eta squared value for the interaction effect on burnout was 0.559, indicating a large intervention effect. For adaptive coping strategies, the time-by-group interaction was also significant, showing that participants who received resilience training demonstrated a

stronger increase in adaptive coping strategies compared with participants in the control group. The effect size for this interaction was 0.525, which also reflects a large effect. For maladaptive coping strategies, the significant interaction effect indicated that resilience training was associated with a greater reduction in maladaptive coping responses in the experimental group compared with the control group. The partial eta squared value of 0.402 suggests a meaningful and substantial intervention effect. Finally, the significant time-by-group interaction for quality of life showed that quality of life improved significantly in the experimental group after the intervention, while the control group remained relatively unchanged. The effect size for the interaction effect on quality of life was 0.514, indicating that resilience training had a strong positive effect on healthcare workers' perceived quality of life. Taken together, these inferential results confirm that resilience training was effective in reducing burnout, improving adaptive coping strategies, decreasing maladaptive coping strategies, and increasing quality of life among healthcare workers.

Table 3

Bonferroni post hoc comparisons of pre-test, post-test, and follow-up scores in the experimental group

Variable	Comparison	Mean difference	Standard error	p-value
Burnout	Pre-test to post-test	16.58	1.46	<0.001
Burnout	Pre-test to follow-up	15.74	1.51	<0.001
Burnout	Post-test to follow-up	0.84	0.69	0.714
Adaptive coping strategies	Pre-test to post-test	13.34	1.19	<0.001
Adaptive coping strategies	Pre-test to follow-up	12.73	1.24	<0.001
Adaptive coping strategies	Post-test to follow-up	0.61	0.58	0.891

Maladaptive coping strategies	Pre-test to post-test	8.12	0.98	<0.001
Maladaptive coping strategies	Pre-test to follow-up	7.46	1.02	<0.001
Maladaptive coping strategies	Post-test to follow-up	0.66	0.47	0.622
Quality of life	Pre-test to post-test	15.79	1.37	<0.001
Quality of life	Pre-test to follow-up	15.05	1.42	<0.001
Quality of life	Post-test to follow-up	0.74	0.63	0.803

As shown in Table 3, the Bonferroni post hoc comparisons revealed significant differences between the pre-test and post-test scores of the experimental group for all study variables. Burnout decreased significantly from pre-test to post-test, indicating that healthcare workers who participated in resilience training experienced a meaningful reduction in occupational burnout after completing the intervention. The difference between pre-test and follow-up burnout scores was also significant, showing that the reduction in burnout was maintained one month after the completion of the training program. However, the difference between post-test and follow-up burnout scores was not statistically significant, which indicates that the effect of the intervention remained stable during the follow-up period and that burnout did not return to the pre-intervention level. For adaptive coping strategies, the experimental group showed a significant increase from pre-test to post-test, and the significant difference between pre-test and follow-up confirmed the persistence of this improvement. The non-significant difference between post-test and follow-up indicates that the improvement in adaptive coping strategies was maintained over time. Regarding maladaptive coping strategies, the results showed a significant decrease from pre-test to post-test and from pre-test to follow-up, suggesting that resilience training reduced the use of ineffective coping responses such as avoidance, disengagement, denial, and self-blame. The non-significant difference between post-test and follow-up further indicates that this reduction remained stable after the intervention. Finally, quality of life increased significantly from pre-test to post-test and from pre-test to follow-up in the experimental group. The lack of a significant difference between post-test and follow-up suggests that the improvement in quality of life was preserved during the follow-up period. In the control group, Bonferroni comparisons did not show significant changes between pre-test, post-test, and follow-up for burnout, coping strategies, or quality of life, indicating that the observed improvements were specific to the group that received resilience training. Overall, the post hoc findings provide further evidence that resilience training produced immediate and stable

improvements in burnout, coping strategies, and quality of life among healthcare workers.

4. Discussion

The present study aimed to determine the effectiveness of resilience training on burnout, coping strategies, and quality of life among healthcare workers in Tehran. The findings showed that resilience training significantly reduced burnout among healthcare workers in the experimental group compared with the control group. The descriptive results indicated a clear decrease in burnout from pre-test to post-test, and this reduction remained stable at follow-up. The repeated-measures analysis also confirmed a significant time-by-group interaction, demonstrating that the observed reduction was not merely the result of time or repeated measurement but was associated with participation in the resilience training program. This finding is consistent with previous literature emphasizing burnout as a major occupational health problem among healthcare workers, clinicians, trainees, and other health-related professionals (Chandawarkar & Chaparro, 2021; Johnson et al., 2021; Owen et al., 2021). Burnout develops when chronic occupational demands exceed available psychological and organizational resources, and healthcare workers are especially vulnerable because their work requires sustained emotional engagement, rapid decision-making, exposure to suffering, interpersonal responsibility, and professional accountability. Studies conducted during and after the COVID-19 period further showed that burnout among hospital-based healthcare workers is strongly associated with cumulative stress, uncertainty, workload, and emotional exhaustion (Lazarides et al., 2021; Maunder et al., 2021). The present findings support this body of research by showing that structured resilience training can function as an effective psychological intervention for reducing burnout symptoms in healthcare workers.

The reduction of burnout in the experimental group may be explained by the core mechanisms targeted in resilience training. Resilience training strengthens the ability to regulate emotional reactions, reinterpret stressful situations, maintain professional purpose, use social support, and apply problem-solving strategies in difficult occupational

situations. These mechanisms are highly relevant to burnout prevention because emotional exhaustion often results from repeated exposure to stress without adequate recovery or cognitive-emotional processing. Previous studies have identified resilience as an important protective factor among healthcare providers, emphasizing that resilient professionals are better able to adapt to workplace adversity and maintain effective functioning under pressure (Sheikhrabari et al., 2022). Similarly, studies on perceived stress, emotional intelligence, and resilience among healthcare professionals indicate that resilience is closely connected with emotional regulation and stress management capacity (Duică et al., 2024). Therefore, the decrease in burnout observed in this study can be interpreted as the result of enhanced psychological flexibility, improved emotional regulation, and greater perceived control over workplace stressors. This interpretation is also aligned with research emphasizing psychological approaches to preventing burnout in health professionals and contemporary strategies for mitigating job burnout (Golparvar & Parsakia, 2023; Naeeni & Nouhi, 2023). In this regard, resilience training does not remove occupational demands, but it may change the way healthcare workers appraise, tolerate, and respond to those demands.

The findings also showed that resilience training significantly improved adaptive coping strategies among healthcare workers. Participants in the experimental group showed increased use of constructive coping responses after the intervention, and this improvement was maintained at follow-up. This result is important because coping strategies represent one of the most direct pathways through which resilience may affect occupational well-being. Adaptive coping strategies such as planning, active coping, acceptance, positive reframing, support-seeking, and emotional regulation help healthcare workers respond to stressors in an organized and purposeful manner. Previous studies have shown that interventions focusing on mindfulness, self-care, professional support, and resilience can strengthen coping resources among healthcare workers and trainees (Hanson et al., 2022; Seo et al., 2021). The present finding is also consistent with evidence indicating that self-regulation plays a mediating role between stress and quality of life in shift-working healthcare professionals, suggesting that improved coping and self-regulatory capacities are central mechanisms in occupational well-being (Mohammed et al., 2025). When healthcare workers learn to identify stress responses, pause before reacting, challenge unhelpful thoughts, communicate needs, and seek

instrumental or emotional support, they become better equipped to manage workplace pressures without becoming overwhelmed by them.

In addition to increasing adaptive coping, resilience training significantly reduced maladaptive coping strategies in the experimental group. The decrease in maladaptive coping remained stable at follow-up, suggesting that participants did not simply experience a temporary motivational effect after the intervention but may have internalized more constructive stress-management patterns. Maladaptive coping responses such as avoidance, denial, disengagement, self-blame, and emotional withdrawal may temporarily reduce discomfort but often intensify burnout and reduce quality of life over time. The reduction of these strategies is consistent with studies showing that healthcare worker well-being interventions should address not only symptoms but also behavioral patterns that maintain occupational distress (Catapano et al., 2023; Shiri et al., 2023). This finding is also compatible with evidence from health profession students showing that resilience is associated with lower distress responses under stressful conditions (Yu et al., 2021). In clinical settings, maladaptive coping may be reinforced by time pressure and institutional culture, because healthcare workers may feel that they have little opportunity to process emotional experiences or seek support. Resilience training may disrupt this pattern by legitimizing self-care, normalizing stress reactions, and teaching participants alternative ways to respond to difficult events.

The present study further found that resilience training significantly improved quality of life among healthcare workers. Quality of life increased from pre-test to post-test in the experimental group and remained higher at follow-up, while the control group showed no meaningful change. This result is theoretically and clinically important because burnout reduction alone is not sufficient to demonstrate comprehensive improvement in healthcare worker well-being. Quality of life reflects broader dimensions of functioning, including physical health, psychological health, social relationships, and environmental satisfaction. The improvement observed in this study suggests that resilience training may have benefits beyond the workplace and may influence participants' general sense of well-being. This finding is aligned with studies emphasizing the importance of wellness, self-care, institutional support, and resilience promotion in healthcare education and practice (Hart et al., 2023; Morgan, 2021). It is also consistent with research highlighting the role of behavioral regulation and stress

management in the quality of life of healthcare professionals (Mohammed et al., 2025). When healthcare workers develop more effective coping skills and experience reduced emotional exhaustion, they may have more energy for social relationships, personal recovery, sleep regulation, and meaningful engagement outside work, all of which can contribute to improved quality of life.

The stability of the intervention effects at follow-up deserves particular attention. The Bonferroni comparisons showed significant differences between pre-test and post-test and between pre-test and follow-up for burnout, coping strategies, and quality of life, while the differences between post-test and follow-up were not significant. This pattern indicates that the intervention effects were maintained over the follow-up period. Such stability is consistent with the idea that resilience training can produce durable changes when participants acquire practical skills that are applicable to real occupational situations. Evidence from mindfulness and compassion-based programs for medical trainees and physicians supports the value of structured, skills-based interventions for improving psychological functioning and reducing burnout-related difficulties (Pouramin et al., 2025; Wong et al., 2025). Similarly, coaching workshops and supervision-based approaches suggest that reflective learning, emotional processing, and structured professional support can help healthcare workers sustain resilience over time (Al-Ghunaim et al., 2023; McEwen et al., 2025). The present findings therefore support the inclusion of resilience training as a practical and sustainable intervention in healthcare settings, particularly when programs are designed to be experiential, relevant to daily occupational stressors, and focused on skill transfer.

The findings of this study also align with broader literature suggesting that burnout prevention should be addressed through both individual and organizational approaches. Resilience training is primarily an individual-level intervention, but its effectiveness may be strengthened when implemented within supportive organizational contexts. Previous reviews have emphasized that healthcare worker stress and burnout are shaped by workload, leadership, communication, professional culture, staffing, supervision, and institutional resources (Dent et al., 2024; Golisch et al., 2023). Therefore, the improvement observed in this study should not be interpreted as evidence that burnout is solely an individual responsibility. Rather, resilience training may be one necessary component of a broader occupational health strategy. The literature on health workforce well-being programs indicates that interventions

are most useful when they are feasible, accessible, and supported by organizational leadership (Dent et al., 2024). Similarly, research on healthcare team communication and department-wide well-being initiatives shows that communication, social support, and shared responsibility are essential for sustainable improvement (Hart et al., 2023; Preis et al., 2022). Thus, resilience training may be particularly effective when it is integrated into institutional wellness programs rather than presented as a separate or optional activity.

The results are also consistent with recent discussions of primary prevention in burnout. Instead of waiting for healthcare workers to develop severe psychological symptoms, preventive interventions aim to enhance protective attributes, strengthen professional support networks, and reduce the likelihood of occupational exhaustion (Naughton et al., 2025). This preventive orientation is especially important because burnout may be associated with professional dissatisfaction, reduced patient care quality, absenteeism, turnover, and in more severe cases, psychiatric comorbidity and suicide risk (Duarte et al., 2023). Evidence from studies on medical trainees, postgraduate physicians, and healthcare workers indicates that burnout is not limited to one career stage and may appear early during training or later during professional practice (Alzain et al., 2024; Baxter et al., 2025; Jerjes & Majeed, 2025). Therefore, resilience training should be considered not only for workers who already show high burnout but also for healthcare professionals at risk of future occupational strain. Programs designed to promote self-care, fitness, wellness, and resilience during demanding training or clinical work may help reduce the cumulative burden of professional stress (Chhabra et al., 2022; Morgan, 2021).

The present findings also have implications for professional identity and readiness to practice. Healthcare workers who are emotionally exhausted and dependent on maladaptive coping strategies may experience a weakened sense of professional competence, reduced meaning in work, and lower engagement with patients and colleagues. Conversely, resilience training may support professional identity by helping workers reconnect with personal values, clarify professional purpose, and develop confidence in managing stress. Research on professional identity among physicians in standardized residency training programs has shown that psychosocial factors are closely related to how professionals understand and sustain their role (Zeng et al., 2024). Similarly, readiness to practice among healthcare workers may depend not only on technical knowledge but

also on emotional preparedness, adaptability, and access to support (Hussein et al., 2025). The current study suggests that resilience training can contribute to these professional capacities by improving coping patterns and reducing burnout. This interpretation is also supported by calls to protect the health of healers and close the gap between knowledge and practice in healthcare worker well-being (Bhadoria et al., 2025).

5. Conclusion

Overall, the findings of this study provide empirical support for the effectiveness of resilience training in improving psychological and occupational outcomes among healthcare workers. The intervention reduced burnout, increased adaptive coping strategies, reduced maladaptive coping strategies, and improved quality of life, with effects maintained at follow-up. These findings are consistent with previous evidence on resilience curricula, mindfulness-based interventions, workplace well-being programs, coaching, supervision, and organizational stress-management strategies (Catapano et al., 2023; Hanson et al., 2022; McEwen et al., 2025; Seo et al., 2021; Shiri et al., 2023). The findings also support the argument that healthcare worker well-being should be understood as a multidimensional construct involving emotional exhaustion, coping behavior, self-regulation, professional identity, social support, and general quality of life. By targeting these interrelated domains, resilience training appears to offer a practical and theoretically grounded approach to strengthening the psychological resources of healthcare workers.

6. Limitations & Suggestions

This study had several limitations that should be considered when interpreting the findings. First, the sample consisted of healthcare workers from Tehran, and although the sample was appropriate for the quasi-experimental design, the results may not be generalizable to healthcare workers in other cities, rural areas, private hospitals, or different healthcare systems. Second, the study relied on self-report questionnaires, which may be influenced by response bias, social desirability, or participants' subjective interpretation of the items. Third, the follow-up period was limited to one month, and therefore the long-term stability of the intervention effects remains unclear. Fourth, although the control group received no intervention during the study period, the use of an active control group could have

provided stronger evidence regarding the specific effects of resilience training compared with general attention, group interaction, or educational participation. Fifth, occupational variables such as workload, shift schedule, unit type, patient volume, and organizational support were not analyzed in depth, although these factors may influence burnout, coping, and quality of life.

Future studies are recommended to examine the effectiveness of resilience training with larger and more diverse samples of healthcare workers from different cities, hospitals, specialties, and healthcare settings. Researchers should consider using randomized controlled trial designs with active control groups to provide stronger causal evidence. Longer follow-up periods, such as three months, six months, or one year, are also recommended to determine whether the benefits of resilience training remain stable over time. Future research may also investigate the mechanisms through which resilience training affects burnout and quality of life, including the mediating roles of emotional regulation, self-compassion, perceived social support, psychological flexibility, and work engagement. In addition, future studies could compare resilience training with other interventions such as mindfulness-based stress reduction, compassion-focused training, cognitive-behavioral stress management, or organizational well-being programs. Mixed-methods designs may also be useful for understanding healthcare workers' lived experiences of resilience training and identifying which components of the intervention are most meaningful in clinical practice.

Based on the findings of this study, healthcare organizations are encouraged to integrate resilience training into occupational health, staff development, and employee well-being programs. Such training should be practical, skills-based, and directly connected to the real stressors healthcare workers experience in clinical settings. Hospital managers, supervisors, and mental health professionals can use resilience training to help staff strengthen emotional regulation, adaptive coping, problem-solving, communication, self-care, and support-seeking behaviors. However, resilience training should not be used as a substitute for organizational responsibility. To achieve sustainable improvement, healthcare institutions should combine individual-level resilience programs with organizational strategies such as workload management, adequate staffing, supportive leadership, psychological safety, access to counseling, peer-support systems, and regular assessment of staff well-being. Implementing resilience training as part of a broader culture of care can

help reduce burnout, improve coping patterns, enhance quality of life, and support a healthier and more effective healthcare workforce.

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Declaration of Interest

The authors of this article declared no conflict of interest.

Ethical Considerations

The study protocol adhered to the principles outlined in the Helsinki Declaration, which provides guidelines for ethical research involving human participants.

Transparency of Data

In accordance with the principles of transparency and open research, we declare that all data and materials used in this study are available upon request.

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Authors' Contributions

All authors equally contributed to this article.

References

- Al-Ghunaim, T., Johnson, J., Biyani, C. S., Coleman, R., Simms-Ellis, R., & O'Connor, D. B. (2023). Evaluation of the Reboot Coaching Workshops Among Urology Trainees: A Mixed Method Approach. *Bjui Compass*, 4(5), 533-542. <https://doi.org/10.1002/bco2.249>
- Alzain, N. M., Almsned, F., Albunaian, N., Alotaibi, F., AlBeshir, M. S., Yosef, M., & Ali, M. I. (2024). Burnout Prevalence Among Postgraduate Medical Trainees in the Eastern Health Cluster, Saudi Arabia: A Cross-Sectional Study. <https://doi.org/10.21203/rs.3.rs-4997589/v1>
- Baxter, V., Myuran, T., Eboh, W., Majdzadeh, R., & Green, F. (2025). Evaluating the Well-Being of ENT Trainees in the UK: Survey Findings. *The Journal of Laryngology & Otology*, 140(1), 71-77. <https://doi.org/10.1017/s0022215125103848>
- Bhadoria, A. S., Pandey, P., Anirvan, P., & Kumar, R. (2025). Protecting the Health of Healers: Knowledge-to-Practice Gap Among Healthcare Professionals. *Journal of Family Medicine and Primary Care*, 14(11), 4409-4411. https://doi.org/10.4103/jfmpc.jfmpc_2024_25
- Catapano, P., Cipolla, S., Sampogna, G., Perris, F., Luciano, M., Catapano, F., & Fiorillo, A. (2023). Organizational and Individual Interventions for Managing Work-Related Stress in Healthcare Professionals: A Systematic Review. *Medicina*, 59(10), 1866. <https://doi.org/10.3390/medicina59101866>
- Chandawarkar, A., & Chaparro, J. D. (2021). Burnout in Clinicians. *Current Problems in Pediatric and Adolescent Health Care*, 51(11), 101104. <https://doi.org/10.1016/j.cppeds.2021.101104>
- Chhabra, S., Malhotra, N., Choubey, S., Sasidharan, S., & Sahni, N. (2022). Breaking Barriers to Remain Healthy and Fit During a Residency in Anaesthesiology. *Indian Journal of Anaesthesia*, 66(01), 77-81. https://doi.org/10.4103/ija.ija_1110_21
- Dent, R. B., Strasser, J., Muñoz, L. R., Ziemann, M., DeSmidt, B., Pittman, P., & Chen, C. (2024). Lessons Learned From the Health Resources and Services Administration Health Workforce Well-Being Grantees. *Families Systems & Health*, 42(3), 317-332. <https://doi.org/10.1037/fsh0000911>
- Duarte, D., El-Hagrassy, M. M., Couto, T. C. e., Gurgel, W. d. S., Minuzzi, L., Saperson, K., & Corrêa, H. (2023). Challenges and Potential Solutions for Physician Suicide Risk Factors in the COVID-19 Era: Psychiatric Comorbidities, Judicialization of Medicine, and Burnout. *Trends in Psychiatry and Psychotherapy*. <https://doi.org/10.47626/2237-6089-2021-0293>
- Duică, L., Antonescu, E., Totan, M., Antonescu, O. R., Boța, G., Maniu, I., Pîrllog, M. C., & Silișteanu, S. C. (2024). Perceived Stress, Resilience and Emotional Intelligence in Romanian Healthcare Professionals. *Healthcare*, 12(23), 2336. <https://doi.org/10.3390/healthcare12232336>
- Golisch, K. B., Sanders, J. M., Rzhetsky, A., & Tatebe, L. C. (2023). Addressing Surgeon Burnout Through a Multi-Level Approach: A National Call to Action. *Current Trauma Reports*, 9(2), 28-39. <https://doi.org/10.1007/s40719-022-00249-x>
- Golparvar, M., & Parsakia, K. (2023). Building Resilience: Psychological Approaches to Prevent Burnout in Health Professionals. *KMAN Counseling and Psychology Nexus*, 1(1), 159-166. <https://doi.org/10.61838/kman.psychnexus.1.1.18>
- Hanson, P., Villarreal, M., Khan, M., Dale, J., & Sankar, S. (2022). Effect of an Online Mindfulness Course for Hospital Doctors During COVID-19 Pandemic on Resilience and Coping. *Journal of Primary Care & Community Health*, 13. <https://doi.org/10.1177/21501319221138425>
- Hart, J., Orange, J. S., Runkle, W. M., Catalozzi, M., Bombacie, M., Smerling, A., & Strauss, H. B. (2023). POWER: Promoting Overall Well-Being Engagement and Resilience in Pediatrics—Implementing a Department-Wide Initiative Including Students, Staff and Faculty. *Integrative and Complementary Therapies*, 29(2), 60-64. <https://doi.org/10.1089/ict.2023.29062.jha>
- Heath, C., Sommerfield, A., & Ungern-Sternberg, B. S. v. (2020). Resilience Strategies to Manage Psychological Distress Among Healthcare Workers During the COVID-19 Pandemic: A Narrative Review. *Anaesthesia*, 75(10), 1364-1371. <https://doi.org/10.1111/anae.15180>
- Hussein, S., Ishaky, L., Nowrouzi-Kia, B., Loughton, S., & Gohar, B. (2025). Exploring the Readiness to Practice of Underrepresented Healthcare Workers: A Scoping Review. *Sage Open Medicine*, 13. <https://doi.org/10.1177/20503121241312532>
- Jerjes, W., & Majeed, A. (2025). The Unseen Costs of Medical Training in the UK: A Growing Crisis. *Frontiers in Medicine*, 12. <https://doi.org/10.3389/fmed.2025.1592010>

- Johnson, J., Al-Ghunaim, T., Biyani, C. S., Montgomery, A., Morley, R., & O'Connor, D. B. (2021). Burnout in Surgical Trainees: A Narrative Review of Trends, Contributors, Consequences and Possible Interventions. *Indian Journal of Surgery*, 84(S1), 35-44. <https://doi.org/10.1007/s12262-021-03047-y>
- Khubchandani, J., Batra, K., Yockey, R. A., Webb, F. J., & Banerjee, S. (2024). Health Care Workers' Risk Behaviors and Health Status: Hidden Realities or New Paradigms? *Journal of Medicine Surgery and Public Health*, 2, 100097. <https://doi.org/10.1016/j.gjmedi.2024.100097>
- Lazarides, A. L., Belay, E. S., Anastasio, A. T., Cook, C., & Anakwenze, O. (2021). Physician Burnout and Professional Satisfaction in Orthopedic Surgeons During the COVID-19 Pandemic. *Work a Journal of Prevention Assessment & Rehabilitation*, 69(1), 15-22. <https://doi.org/10.3233/wor-205288>
- Maunder, R., Heeney, N. D., Strudwick, G., Shin, H. D., O'Neill, B., Young, N. K., Jeffs, L., Barrett, K., Bodmer, N. S., Born, K., Hopkins, J., Jüni, P., Perkhun, A., Price, D., Razak, F., Mushquash, C. J., & Mah, L. (2021). Burnout in Hospital-Based Healthcare Workers During COVID-19. <https://doi.org/10.47326/ocsat.2021.02.46.1.0>
- McEwen, A., Davys, A. M., & Weil, J. (2025). Supervision for Genetic Counselors: The Role of Career-long Supervision to Develop Resilient Practitioners. *Journal of Genetic Counseling*, 34(1). <https://doi.org/10.1002/jgc4.70014>
- Mohammed, S., Walker, J., Zambrana, E. H., Gupta, V., Jung, K., Pandi-Perumal, S. R., & Manzar, M. D. (2025). Self-Regulation Mediates the Relationship Between Stress and Quality of Life in Shift-Working Healthcare Professionals: Behavioral Clustering Insights. *European Journal of Investigation in Health Psychology and Education*, 15(9), 180. <https://doi.org/10.3390/ejihpe15090180>
- Morgan, M. V. (2021). Promoting Student Wellness and Self-Care During COVID 19: The Role of Institutional Wellness. *Frontiers in Psychiatry*, 12. <https://doi.org/10.3389/fpsy.2021.797355>
- Naeeni, S. K., & Nouhi, N. (2023). Job Burnout Mitigation: A Comprehensive Review of Contemporary Strategies and Interventions. *KMAN Counseling and Psychology Nexus*, 1(1), 91-101. <https://doi.org/10.61838/kman.psychnexus.1.1.12>
- Naughton, S., Marques, L., Murphy, F., & Clarke, M. (2025). What Should Primary Prevention in Burnout Look Like? Promoting Attributes, Roles and Social Networks With Instrumental Outcomes. *Medical Science Educator*, 35(2), 1093-1100. <https://doi.org/10.1007/s40670-024-02276-6>
- Owen, J., Crouch-Read, L., & Fisher, P. (2021). Stress and Burnout in Improving Access to Psychological Therapies (IAPT) Trainees: A Systematic Review. *The Cognitive Behaviour Therapist*, 14. <https://doi.org/10.1017/s1754470x21000179>
- Pouramin, P., Taylor, R. W., Llaneras, N. S., Sivakumar, A., Ridley, C. H., Mackinnon, S. E., & Krauss, E. M. (2025). Five Practical Video Modules to Reduce Physician Burnout Through Mindfulness and Systematic Review of Evidence. *Plastic & Reconstructive Surgery Global Open*, 13(8), e6878. <https://doi.org/10.1097/gox.0000000000006878>
- Preis, H., Dobias, M., Cohen, K., Bojsza, E., Whitney, C., & Pati, S. (2022). A Mixed-Methods Program Evaluation of the Alda Healthcare Experience- A Program to Improve Healthcare Team Communication. *BMC Medical Education*, 22(1). <https://doi.org/10.1186/s12909-022-03972-w>
- Schwartz, A. C., & Brenner, A. M. (2021). Psychiatric Education and COVID-19: Challenges, Responses, and Future Directions. *Academic Psychiatry*, 45(5), 535-538. <https://doi.org/10.1007/s40596-021-01530-y>
- Seo, C., Corrado, M., Fournier, K., Bailey, T., & Haykal, K.-A. (2021). Addressing the Physician Burnout Epidemic With Resilience Curricula in Medical Education: A Systematic Review. *BMC Medical Education*, 21(1). <https://doi.org/10.1186/s12909-021-02495-0>
- Sheikhrabari, A., Peyrovi, H., & Khankeh, H. R. (2022). The Main Features of Resilience in Healthcare Providers: A Scoping Review. *Medical Journal of the Islamic Republic of Iran*. <https://doi.org/10.47176/mjiri.36.3>
- Shiri, R., Nikunlaakso, R., & Laitinen, J. (2023). Effectiveness of Workplace Interventions to Improve Health and Well-Being of Health and Social Service Workers: A Narrative Review of Randomised Controlled Trials. *Healthcare*, 11(12), 1792. <https://doi.org/10.3390/healthcare11121792>
- Steffey, M. A., Griffon, D. J., Risselada, M., Scharf, V. F., Buote, N. J., Zamprogno, H., & Winter, A. L. (2023). Veterinarian Burnout Demographics and Organizational Impacts: A Narrative Review. *Frontiers in veterinary science*, 10. <https://doi.org/10.3389/fvets.2023.1184526>
- Wong, F. L., Ashtiani, N., Cuomo, R., Shirazi, A., Herbert, M. S., Chu, G. M., & Shapiro, D. (2025). The Impact of a Mindful Compassion Program for Medical Trainees. *BMC Medical Education*, 25(1). <https://doi.org/10.1186/s12909-025-07439-6>
- Yu, A., Wilkes, M. S., Iosif, A. M., Rea, M., Fisher, A., Fine, J., Perry, R., Rice, E., Jandrey, K. E., Griffin, E., & Sciolla, A. (2021). Exploring the Relationships Between Resilience and News Monitoring With COVID Distress in Health Profession Students. *Academic Psychiatry*, 45(5), 566-574. <https://doi.org/10.1007/s40596-021-01444-9>
- Zeng, Z., Lu, Z., Zeng, X., Gan, Y., Jiang, J., Chen, Y., & Huang, L. (2024). Professional Identity and Its Associated Psychosocial Factors Among Physicians From Standardized Residency Training Programs in China: A National Cross-Sectional Study. *Frontiers in Medicine*, 11. <https://doi.org/10.3389/fmed.2024.1413126>