

Occupational Stress and Its Determinants among Red Crescent Society Rescue Workers in Markazi Province, Iran

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Original Article

Abstract

INTRODUCTION: Roadside rescue workers are highly exposed to occupational stress due to the critical and traumatic nature of their duties. However, limited evidence exists regarding stress levels among this workforce in Iran. This study aimed to assess occupational stress, identify its key dimensions, and examine socio-demographic predictors among Red Crescent Society (RCS) rescue workers in Markazi province.

METHODS: In this cross-sectional descriptive–correlational study, 327 rescue workers from road-based stations were selected using proportionate stratified random sampling in 2025. Data were collected using the Philip L. Rice Occupational Stress Questionnaire (57 items across interpersonal relations, physical working conditions, and job interests) and a demographic form. Reliability was confirmed ($\alpha=0.89$). Data were analyzed using t-tests, ANOVA, and multiple linear regression.

FINDINGS: The mean occupational stress score was 187.4 ± 26.8 out of 285 (65.7%), indicating a high stress level. Interpersonal relations (92.1 ± 14.5) and physical working conditions (71.8 ± 12.1) were high, while job interests (27.8 ± 4.2) were moderate. Married rescue workers reported significantly higher stress than single ones ($p<0.001$), and those with over 20 years of experience had higher stress levels ($p < 0.01$). Marital status ($\beta=0.35$) and work experience ($\beta=0.28$) explained 24% of stress variance ($R^2=0.24$, $p<0.001$).

CONCLUSION: The findings indicate that Occupational stress among RCS rescue workers is high. Targeted interventions, particularly for married and experienced staff, are recommended to reduce stress and improve performance.

Keywords: Occupational stress; Rescue workers; Red Crescent Society (RCS); Work experience.

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Introduction

Work represents a fundamental aspect of human life that extends beyond financial provision, fulfilling essential needs such as psychological and physical stimulation, social interaction, and a sense of self-worth. Nevertheless, work can also serve as a significant source of psychological stress (1). Evidence from previous studies suggests that the nature of one's occupation plays a critical role in determining susceptibility to various forms of psychological stress (2, 3).

In the present century, occupational stress has gained considerable attention in organizational behavior research, with increasing focus on its causes and consequences among employees. Although stress is not inherently negative or destructive, a moderate level of stress is necessary for motivation, activation, and improved work performance, and may enhance employee productivity and efficiency (4). However, beyond an individual's tolerance threshold, it can lead to adverse outcomes.

A 2025 meta-analysis demonstrated that high perceived stress among emergency medical

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personnel is associated with significantly reduced job satisfaction and increased turnover intention (5). Recent systematic reviews have shown that emergency responders experience significantly higher levels of emotional exhaustion, depersonalization, and reduced personal accomplishment compared to other occupational groups, due to repeated exposure to traumatic events and time pressure (6, 7).

Such conditions not only threaten their mental health but are also directly associated with reduced job performance, increased absenteeism, and ultimately reduced quality of care and service delivery (8, 9). Emergency rescue and relief occupations are considered among the most stressful professions due to continuous exposure to traumatic scenes, death, suffering patients, and critical conditions. Although victims are the primary sufferers of incidents, the close interaction of rescue workers with victims, along with their continuous exposure to traumatic scenes, places them at risk of secondary traumatic stress similar to survivors (10).

Recent systematic reviews have reported a prevalence of Post-Traumatic Stress Disorder (PTSD) of approximately 14.3% among ambulance personnel, along with elevated risks of depression, anxiety, and burnout (11, 12). In addition, aid workers significantly suffer from sleep disorders related to shift work, which further exacerbate occupational stress (13). However, psychological consequences in aid workers are often overlooked, as the severity of trauma in direct victims tends to receive greater attention, potentially transforming rescue workers into secondary psychological victims (10, 14).

A common misconception is that rescue workers, due to their specialized training and voluntary engagement, are psychologically resilient and more emotionally robust than disaster victims (15, 16). Consequently, their psychological needs are often neglected. Many rescue workers also tend to suppress their psychological distress due to fear of job insecurity or being perceived as incompetent by colleagues and the organization (17).

Several studies in Iran and worldwide have examined occupational stress among different groups, including healthcare workers, emergency nurses, firefighters, and COVID-19 frontline staff (18–21). These studies indicate that factors such as poor interpersonal relations, unfavorable working conditions, inadequate social support,

role overload, and work–family conflict are among the main sources of occupational stress.

International evidence further suggests that prehospital emergency personnel report mission-related pressure, role ambiguity, and resource shortages as major stressors (22). Moreover, perceived stress can affect job satisfaction both directly and indirectly through burnout, while psychological capital (including self-efficacy, hope, resilience, and optimism) moderates this relation (23).

Non-pharmacological interventions, such as mindfulness-based programs and emotion regulation strategies, have been shown to effectively reduce stress and burnout among rescue and relief workers (24, 25).

However, systematic evidence regarding the occupational stress status of RCS rescue workers in Markazi Province, Iran, remains limited. Considering the necessity of improving working conditions in emergency organizations, particularly the RCS, and the undeniable impact of occupational stress on employees' personal and professional lives, the use of valid and standardized instruments is essential.

Accordingly, the present study utilized the Philip L. Rice Occupational Stress Questionnaire, one of the most widely used instruments for assessing occupational stress, to examine stress dimensions among rescue workers in the RCS.

This study aimed to determine the level of occupational stress, identify its dominant dimensions, and examine the predictive role of sociodemographic variables (age, work experience, marital status, and employment type) in explaining occupational stress among RCS rescue workers in Markazi Province. The following research questions were addressed: What is the level of occupational stress among RCS rescue workers, and which of the three dimensions (interpersonal relations, physical working conditions, and job interests) has the highest mean score? From the perspective of rescue workers, what are the most important stressors in each dimension, and how are they ranked? To what extent do sociodemographic variables predict occupational stress among rescue workers, and what is the contribution of each variable to variance explanation?

Methods

This descriptive–correlational, cross-sectional study was carried out in 2025 among personnel

stationed at road rescue bases of RCS in Markazi province. All personnel at these bases were male, and the study population comprised 1,350 rescue workers based on official records. Also, data analysis was performed using SPSS-28.

The sample size was determined using Cochran's formula (95% confidence level, 0.05 margin of error, $p=0.5$), yielding 297 participants; this number was increased to 327 to account for potential attrition. Participants were selected through stratified random sampling proportional to the number of rescue workers at each base.

Inclusion criteria were at least one year of operational experience, full-time employment, a minimum of six months of service at the current base, and provision of informed consent. Exclusion criteria included incomplete questionnaires (more than 10% missing responses), withdrawal during the study, and self-reported diagnosed psychiatric disorders.

Data were collected using a two-part instrument consisting of a demographic questionnaire (age, marital status, work experience, employment type, and education level) and the Philip L. Rice Occupational Stress Questionnaire, localized in Iran by Hatami (1999). The instrument comprises 57 items across three dimensions: interpersonal relations (26 items), physical working conditions (22 items), and job interests (9 items), with a total score range of 57–285. Items are rated on a 5-point Likert scale and categorized into low, moderate, and high stress levels based on quartile distribution.

Content validity of the questionnaire had been previously established. In the present study, face and content validity were reassessed by seven experts in health management and psychology and three experienced rescue workers, resulting in minor wording revisions. Reliability was evaluated using Cronbach's alpha based on a pilot sample of 30 participants (excluded from the final analysis), yielding coefficients of 0.89 for the overall scale and 0.91, 0.85, and 0.78 for interpersonal relations, physical working conditions, and job interests, respectively. These results indicate satisfactory internal consistency and are consistent with previous studies.

The normality of data distribution was assessed using the Kolmogorov–Smirnov test ($p>0.05$), supporting the use of parametric tests. Descriptive statistics, including mean, standard deviation, minimum, maximum, and frequency percentages, were used to summarize the data. An

independent samples t-test was applied to compare occupational stress scores by marital status, while one-way ANOVA was used to examine differences across work experience, employment type, and education level; Tukey's post hoc test was conducted for pairwise comparisons where appropriate.

Within-group comparisons of the three stress dimensions were conducted using repeated measures ANOVA, or the Friedman test when assumptions were not met. Additionally, stressors within each dimension were ranked based on the mean scores of the 57 items. For items in the job interests dimension with reverse scoring, lower mean scores were interpreted as indicating higher stress. Finally, multiple linear regression analysis (stepwise method) was performed to identify predictors of occupational stress, with age, work experience, marital status (coded), and employment type as independent variables and total stress score as the dependent variable. Statistical significance was set at $p<0.05$.

Findings

A total of 327 rescue workers from road rescue bases of the RCS in Markazi province participated in this study. The mean age of participants was 36.2 ± 5.8 years, and the mean work experience was 12.4 ± 7.3 years. The majority of participants were married (77.7%). Regarding work experience, 17.4% had less than 3 years, 37.3% had 3–10 years, 30.9% had 10–20 years, and 14.4% had more than 20 years of experience.

The mean total occupational stress score was 187.4 ± 26.8 , indicating a high level of stress. Among the dimensions, interpersonal relations had the highest mean score, followed by physical working conditions and job interests (Table 1).

Table 1. Descriptive statistics of occupational stress dimensions among rescue workers ($n=327$)

Dimension of Occupational Stress	Possible Score Range	Mean $\pm$ Standard Deviation	Stress Level
Interpersonal Relations	26–130	92.1 ± 14.5	High
Physical Working Conditions	22–110	71.8 ± 11.2	High
Job Interests	9–45	23.5 ± 6.1	Moderate
Total Occupational Stress	57–285	187.4 ± 26.8	High

Repeated measures ANOVA revealed a statistically significant difference among the three dimensions ($F(2,652)=33.94$, $p<0.001$). Bonferroni post hoc analysis indicated that interpersonal relations scores were significantly higher than

those of the other two dimensions ($p < 0.001$), and physical working conditions scores were significantly higher than job interests ($p < 0.01$).

Table 2. Comparison of occupational stress dimensions based on marital status

Occupational Stress Dimension	Married (n=254)	Single (n=73)	t-value	p-value
Interpersonal Relations	94.8 ± 13.9	83.5 ± 14.2	4.18	< 0.001
Physical Conditions	73.5 ± 10.6	66.2 ± 11.8	3.82	< 0.001
Job Interests	24.2 ± 5.8	20.6 ± 6.4	3.12	0.002
Total Score	192.5 ± 24.1	170.3 ± 28.9	5.38	< 0.001

Independent samples t-test showed that married rescue workers reported significantly higher levels of occupational stress than single rescue workers across all dimensions ($p < 0.01$). The largest difference was observed in the interpersonal relations dimension. These differences were also reflected in the total stress score, indicating consistently higher stress among married individuals (Table 2).

Table 3. Comparison of total occupational stress scores by work experience

Work Experience Group	n (%)	Mean ± SD
< 3 years	57 (17.4%)	174.2 ± 25.6
3–10 years	122 (37.3%)	180.5 ± 24.9
10–20 years	101 (30.9%)	190.3 ± 26.1
> 20 years	47 (14.4%)	205.8 ± 27.4
Total	327 (100%)	187.4 ± 26.8

A one-way ANOVA showed a significant difference in total occupational stress across work experience groups ($F(3,323)=9.68$, $p < 0.001$). Tukey's post hoc test indicated that rescue workers with >20 years of experience reported significantly higher stress than those with <3 years and 3–10 years ($p < 0.01$). Additionally, individuals with 10–20 years of experience had

higher stress compared to those with <3 years ($p < 0.05$). Overall, occupational stress increased with greater work experience (Table 3).

Predictors of Occupational Stress

A stepwise multiple linear regression analysis was conducted to examine the contribution of demographic variables (age, work experience, marital status, and employment type) to occupational stress. Regression assumptions were tested and met. The final model was statistically significant ($F(2, 324) = 27.56$, $p < 0.001$) and explained 24% of the variance in occupational stress ($R^2 = 0.24$; adjusted $R^2 = 0.23$). Only marital status and work experience remained significant predictors, while age and employment type were excluded ($p > 0.05$).

Marital status ($\beta = 0.35$, $p < 0.001$) emerged as the strongest predictor, followed by work experience ($\beta = 0.28$, $p < 0.001$), indicating that being married and having greater work experience were associated with higher levels of occupational stress.

Table 4. Results of multiple linear regression analysis for predicting occupational stress

Predictor	B	SE	β	t	p-value
Constant	152.4	6.8	—	22.41	< 0.001
Marital status (married vs. single)	18.6	3.5	0.35	5.31	< 0.001
Work experience (years)	1.2	0.3	0.28	4.00	< 0.001

Ranking of Stressors Within Each Dimension

To identify the most prominent occupational stressors, mean scores of the 57 questionnaire items were calculated and ranked within each dimension. In the job interests dimension, some items were reverse-coded; therefore, lower mean scores indicate higher stress.

Table 5. Top five ranked stressors across the three dimensions

Dimension	Rank	Item No.	Item (Abbreviated)	Mean Score
Interpersonal Relations	1	2	Unclear job descriptions	4.03
	2	3	Uncertainty about expectations	3.95
	3	10	Tension between operational and administrative staff	3.95
	4	7	Inefficient supervisors with enforced compliance	3.92
	5	16	Lack of recognition by supervisors	3.92
Physical Work Environment	1	38	Excessive responsibilities assigned	4.33
	2	30	Work dominated by emergency situations	4.23
	3	46	Insufficient in-service training	3.92
	4	40	Inefficient welfare personnel	3.72
	5	39	Shortage of welfare personnel	3.67
Job Interests	1	57	Would not choose this job again	2.23*
	2	50	Low job excitement	2.28*
	3	55	Continuing job due to financial need	2.05*
	4	52	Loss of interest in work	2.77
	5	56	Feeling trapped in the job	2.90

*Note: In the job interests dimension, lower scores indicate higher stress due to reverse coding.

In the interpersonal relations dimension, the highest-ranked stressors included unclear job descriptions, uncertainty about expectations, tension between operational and administrative staff, inefficient supervision, and lack of recognition. In the physical working conditions dimension, excessive workload, the predominance of emergency situations, insufficient in-service training, and shortages and inefficiencies in welfare personnel were identified as the main stressors. In the job interests dimension, key stressors reflected reduced motivation, including unwillingness to reselect the job, low job excitement, continuation due to financial necessity, loss of interest, and feelings of entrapment. The top five stressors in each dimension are presented in Table 5.

Discussion and Conclusion

The findings demonstrate that rescue workers of the RCS in Markazi province experience high levels of occupational stress (mean score: 187.4 out of 285), exceeding levels reported in comparable Iranian studies. For example, Rashidi et al. (18) reported moderate stress among employees of Ilam University of Medical Sciences, while Mollaahmadi et al. (19) found lower stress levels among community health workers. These differences are likely attributable to the crisis-oriented nature of rescue work and continuous exposure to traumatic events.

Consistent with these findings, international evidence indicates that emergency and life-threatening occupations are associated with elevated stress levels. A systematic review by Gill et al. 2025 (5) highlighted the high prevalence of perceived stress among emergency medical personnel and its association with reduced job satisfaction and increased turnover intention. Similarly, Golshiri et al. (20) reported significantly higher stress levels among emergency nurses compared to administrative staff.

Among the dimensions of occupational stress, interpersonal relations had the highest mean score, indicating that organizational communication, supervisory support, and workplace interactions are major sources of stress. This aligns with findings from Samadirad et al. (21), Bromandan et al. (22), and Meyer et al. 2024 (24), emphasizing the critical role of intra-organizational communication. These results suggest that, beyond the inherent stress of rescue work, the quality of workplace relations plays a decisive role

in shaping stress levels. Improving communication and strengthening social support systems may therefore substantially reduce occupational stress.

Marital status was also significantly associated with occupational stress, with married rescue workers reporting higher stress levels than single individuals. This finding can be explained by intensified work–family conflict, as rescue work involves irregular hours, prolonged missions, and life-threatening conditions. This interpretation is supported by Andiyana et al. (7) (2026) and Sharp et al. (15) (2022), although it contrasts with findings by Rashidi et al. (18), likely due to differences in occupational context.

Work experience showed a positive association with stress, with rescue workers having more than 20 years of experience reporting the highest levels. Although some studies suggest that experience reduces stress, this finding may be explained by the cumulative effects of repeated exposure to traumatic events, leading to burnout and secondary traumatic stress. Supporting this explanation, Marvin et al. (11) (2023) reported reduced coping capacity over time, while Tham et al. (16) (2024) demonstrated cumulative effects of chronic stress on burnout and resilience among ambulance personnel.

Multiple regression analysis identified marital status ($\beta = 0.35$) and work experience ($\beta = 0.28$) as significant predictors, explaining 24% of the variance in occupational stress, representing a moderate effect size based on Cohen's criteria. This indicates that, although demographic factors are important, a substantial proportion of stress is influenced by other variables such as perceived organizational support, psychological capital, personality traits, coping strategies, and the psychosocial work environment. Recent studies highlight the buffering role of these factors; for instance, Hu et al. (25) (2025) demonstrated that psychological capital mitigates the relationship between stress and burnout. Additionally, non-pharmacological interventions—such as mindfulness-based approaches, psychological first aid, and inquiry-based stress reduction—have been shown to effectively reduce stress among healthcare and emergency personnel (23, 26).

Rescue workers in Markazi province experience high levels of occupational stress, with interpersonal relations as the primary stress dimension and marital status and prolonged work experience as key risk factors. These findings underscore the need for targeted interventions to

improve organizational communication, enhance social support, and strengthen psychological resilience.

Recommended actions include: 1) implement stress management and resilience training programs, particularly for married and experienced personnel; 2) provide communication and conflict resolution training; 3) strengthen organizational support systems, including work–family balance initiatives; 4) optimize work schedules to reduce cumulative stress; and 5) conduct longitudinal and interventional studies to evaluate stress reduction strategies and identify additional moderating factors.

Given the critical role of rescue workers in emergency response systems, addressing their psychological well-being should be considered a strategic priority. Policymakers and organizational leaders are urged to implement effective measures to safeguard the mental health of this essential workforce.

This study has several limitations. Its cross-sectional design limits causal inference, and reliance on self-report measures may introduce response bias. The sample was restricted to a single province, limiting generalizability. Additionally, important moderating variables such as resilience, social support, and coping strategies were not examined. Future research should adopt longitudinal designs and incorporate these factors.

Compliance with Ethical Guidelines

Ethical principles were strictly observed throughout all stages of the study, and participant confidentiality was fully ensured.

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Author's Contributions

This study was designed and conceptualized by Mohsen Khorram, with Saeed Givehchi contributing to the development of the theoretical framework and study design. Material preparation, data collection, and data analysis were performed by Mohsen Khorram, Ghasem Mehrabadi, Elaheh Nebton, and Seyed Loghman Hosseini. Saeed Givehchi, as the corresponding author, supervised the overall implementation of the study. Interpretation of the findings, drafting of the initial manuscript, manuscript editing, and all correspondence and final submission were carried out by Mohsen Khorram. All authors

contributed to revising the manuscript and provided constructive feedback.

Conflict of Interests

The authors declare no conflict of interest.

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