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RESEARCH ARTICLE / ARAŞTIRMA YAZISI

Impact of Occupational Stress on Vietnamese Firefighters' Quality of Life

Mesleki Stresin Vietnamli İtfaiyecilerin Yaşam Kalitesi Üzerindeki Etkisi

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Abstract:

This study aims to explore the extent to which occupational stress impacts the quality of life of firefighters. The study participants included 517 Vietnamese firefighters, with an average age of 30.7 years (SD = 5.0). Data were collected using the 14-item revised Sources of Occupational Stress scale (SOOS-14) and the 26-item World Health Organization Quality of Life instrument (WHOQOL-BREF). Regression analyses were conducted to determine the specific contribution of each stressor to firefighters' levels of quality of life. The research findings revealed that occupational stress negatively affects various aspects of firefighters' quality of life, including physical, psychological, social, and environmental facets. Within the overall model, 21.7% of the variation in quality of life was explained by occupational stressors. Among these, stress from workplace interpersonal factors had the most significant predictors of reduced quality of life, underscoring the critical role of collegial support and organizational climate. In contrast, stress from risks and inequalities in the workplace did not significantly affect the quality of life of firefighters. These findings of this study indicate the importance of implementing strategies that enhance the quality of life for firefighters and reduce occupational stress, particularly through cultivating supportive, inclusive, and collaborative work environments that foster engagement, collegiality, and professional well-being.

Keywords: Firefighter, Occupational stress, Quality of life.

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Öz:

Bu çalışma, mesleki stresin itfaiyecilerin yaşam kalitesini ne ölçüde etkilediğini araştırmayı amaçlamaktadır. Çalışmaya katılanlar, ortalama yaşı 30,7 yıl (SD = 5,0) olan 517 Vietnamlı itfaiyeciydi. Veriler, 14 maddelik revize edilmiş Mesleki Stres Kaynakları ölçeği (SOOS-14) ve 26 maddelik Dünya Sağlık Örgütü Yaşam Kalitesi aracı (WHOQOL-BREF) kullanılarak toplandı. Her bir stresörün itfaiyecilerin yaşam kalitesi düzeylerine özgül katkısını belirlemek için regresyon analizleri yapıldı. Araştırma bulguları, mesleki stresin itfaiyecilerin yaşam kalitesinin fiziksel, psikolojik, sosyal ve çevresel yönler dahil olmak üzere çeşitli yönlerini olumsuz etkilediğini ortaya koydu. Genel modelde, yaşam kalitesindeki değişimin %21,7'si mesleki stresörlerle açıklandı. Bunlar arasında, işyerindeki kişilerarası faktörlerden kaynaklanan stres, yaşam kalitesinin azalmasının en önemli yordayıcılarıydı ve meslektaş desteğinin ve örgütsel iklimin kritik rolünü vurguladı. Buna karşılık, işyerindeki risk ve eşitsizliklerden kaynaklanan stres, itfaiyecilerin yaşam kalitesini önemli ölçüde etkilememiştir. Bu çalışmanın bulguları, özellikle katılımı, meslektaş dayanışmasını ve mesleki refahı teşvik eden destekleyici, kapsayıcı ve iş birliğine dayalı çalışma ortamları oluşturarak itfaiyecilerin yaşam kalitesini artıran ve mesleki stresi azaltan stratejilerin uygulanmasının önemini göstermektedir.

Anahtar Kelimeler: İtfaiyeci, Mesleki stres, Yaşam kalitesi.

Introduction

Firefighters are individuals tasked with rescue and firefighting duties to ensure the safety of life, people, and property in the event of a fire. According to a press release on fire and explosion incidents from the Vietnam Fire Prevention and Rescue Police Department, during the first quarter of 2025, there were 935 fire incidents nationwide, resulting in 15 deaths, 20 injuries, and an estimated property loss of approximately 51.14 billion VND and 140.72 hectares of forest (PCCC, 2025). These statistics reflect the high pressure and intensity of work, as well as the stressful and dangerous situations that firefighters face. This group of workers is also more likely to experience occupational stress than other professions (Isaac& Buchanan, 2021) due to frequent exposure to traumatic events, along with specific pressures such as high physical demands, shift work, and low job control. Additionally, the unique conditions of their living environment, protective gear, relationships with colleagues and superiors, and the fear of being away from their families while on duty (Kazronian et al., 2013) have been identified as causes that make them more susceptible to stress and increase the risk of mental health issues (Johnson et al., 2020). Gibbs et al. (2025) also found that firefighters are concerned about the stigma within the fire service, making them reluctant to seek mental health support, fearing that professionals might not fully understand their challenges. These analyses suggest that occupational stress has a significant impact on the quality of life of firefighters, manifesting in physical and mental health issues (Van Hasselt et al., 2022).

Quality of life is a multidimensional concept encompassing various fields and has been applied in geography, philosophy, medicine, psychology, and more. Therefore, when considering the quality of life, Štreimikienė (2015) emphasizes that the factors determining an individual's quality of life often interact in overlapping ways, requiring a comprehensive evaluation framework. In this study, the authors approach the quality of life with a focus on health aspects, including physical, psychological, and social well-being, as key determinants of quality of life that are particularly important for individuals with chronic diseases (Robinson, 2004). Based on this approach, studies have identified core components, including physical health, mental health, and social relationships, as essential factors in evaluating an individual's overall quality of life (Hendrati, 2024). Supporting this view, the World Health Organization developed a tool to assess quality of life with four domains: physical facet, mental facet, social relationships, and environment (Whoqol Group, 1998). Therefore, an individual's quality of life is understood as a synthesis of various aspects, including factors that can affect physical and mental health and the individual's relationships with their surrounding environment and community (Ahmad et al., 2018).

Many researchers have widely studied the relationship between occupational stress and the quality of life of firefighters (Johnson et al., 2020; Van Hasselt et al., 2022). Psychologically, occupational stress is associated with the risk of developing disorders such as anxiety, depression, post-traumatic stress disorder, and increased suicidal ideation (Johnson et al., 2020). Occupational stress in firefighters negatively affects mental health, including higher levels of burnout, anxiety, and depression compared to other occupational groups (Chen et al., 2020). The higher stress levels and burnout in their work have a significant impact on the mental health and quality of life of firefighters (Mehrifar et al., 2025). Physically, occupational stress negatively impacts the sleep quality of firefighters, a key factor in their mental health (Yook, 2019). Firefighters can be at risk of developing various health conditions, including cardiovascular diseases and musculoskeletal disorders, most of which are related to prolonged occupational stress (Kim et al., 2022).

Although studies worldwide have examined the relationship between occupational stress and the quality of life of firefighters, no research has yet explored the extent to which various sources of job stress impact different aspects of quality of life. Specifically, in Vietnam, there has not been any study investigating the relationship and degree of impact of occupational stress on the quality of life of firefighters. Therefore, this study aims to determine the relationship and explore the extent to which sources of occupational stress affect various aspects of the quality of life of firefighters. In this research, five hypotheses are proposed:

Hypothesis 1: Occupational stress is correlated with and predicts overall quality of life.

Hypothesis 2: Occupational stress is correlated with and predicts physical health.

Hypothesis 3: Occupational stress is correlated with and predicts mental health.

Hypothesis 4: Occupational stress is correlated with and predicts social relationships.

Hypothesis 5: Occupational stress is correlated with and predicts the living environment.

Methods

Participants

The population of this study included active firefighters serving across Vietnam. According to the 2024 report from the Vietnam Fire Prevention and Rescue Police Department, there were 6882 active-duty firefighters nationwide. To determine an appropriate sample size, Yamane's formula (1967, as cited in Ahmed, 2024) was used. This formula calculates the required sample size based on the total population and a chosen margin of error. Using a 5% margin of error, the minimum sample size for this study was estimated to be 378 participants. To improve the representativeness of the sample across different regions, a total of 535 firefighters in Vietnam, were invited to participate in the survey. After data collection was completed, 18 questionnaires were excluded during the screening and cleaning process because they did not meet the set validity criteria. As a result, the final valid sample included 517 participants. They were comprised of 2.6% females and 97.4% males, with an average age of 30.7 years (SD = 5.0).

Research Instruments

The variable of occupational stress was measured using the Sources of Occupational Stress scale (SOOS-14) (Kimbrel et al., 2011). The study measured the frequency of stress occurrences on a 5-point Likert scale, ranging from 1 ("never") to 5 ("very frequently"). In the current study, the Cronbach's alpha coefficient for the scale was also good ($\alpha = 0.81$). Exploratory Factor Analysis (EFA) with a factor loading of 0.5 or higher revealed that the items on the SOOS- 14 scale could be grouped into four subscales: (1) Stress from work pressure and control; (2) Stress from working conditions and lifestyle; (3) Stress from workplace interpersonal factors; (4) Stress from risks and inequalities in the workplace. The score for each subscale was calculated by averaging the item scores. A higher score reflects a higher level of occupational stress and vice versa.

The World Health Organization Quality of Life scale (Whoqol Group, 1998) is widely used to measure an individual's self-reported quality of life across four main domains: physical health, psychological facet, social relationships, and environment. The scale consists of 26 items, including two that assess the individual's overall quality of life and general health. The remaining items are divided into four main domains: physical health, psychological health, social relationships, and environment. Each item is rated on a 5-point Likert scale from 1 (Strongly disagree) to 5 (Strongly agree). Based on the Whoqol Group's research, for items that tend to reflect poor quality of life, the values on the Likert scale should be reversed when scoring to maintain consistency. In the current study, the internal consistency of the four domain scores is satisfactory, with the Cronbach's alpha coefficient ranging from 0.67 to 0.88.

Procedure

Ethical approval for this study was obtained from the Human Research Committee of the University of Social Sciences and Humanities, Vietnam National University, Hanoi (Number: 6933, Date: 16.12.2024). The research process started with an extensive literature review to establish the theoretical foundation and conceptual framework. Subsequently, the survey instrument was developed through the adaptation and validation of established measurement scales. Following approval from the ethics committee, participants was contacted and provided with consent forms prior to data collection. Upon receiving the signed consent form, the survey was carried out in January 2025.

Data Analysis Procedure

All statistical analyses in this study were conducted using SPSS version 24.0. In this study, the mean and standard deviation were used to determine the occupational stress and quality of life among firefighters. The correlation was used to assess the significance of the relationship between sources of occupational stress and quality of life. To determine the exact contribution of occupational stress to firefighters' quality of life, simple regression analysis was employed. Then, the study used multiple regression analyses to examine the exact contribution of each source of stress to the criterion of quality of life.

Results

Descriptive statistics and correlation for all variables

Table 1 shows the correlation coefficients, means, and standard deviations for occupational stress and quality of life.

Table 1. *Correlations and descriptive statistics for all measures*

	1	**1.1**	**1.2**	**1.3**	**1.4**	**2**	**2.1**	**2.2**	**2.3**	**2.4**
1. Overall sources of job stress	**1**									
1.1. work pressure and control (WPC)	.77**	1								
1.2. working conditions and lifestyle (WCL)	.70**	.28**	1							
1.3. workplace interpersonal stressor (WIS)	.73**	.30**	.56**	1						
1.4. risks and inequalities in work (RIW)	.32**	.08	.07	.11**	1					
2. Overall quality of life	**-.42****	**-.23****	**-.35****	**-.45****	-.08	**1**				
2.1. Physical facet	-.41**	-.23**	-.33**	-.42**	-.08	.83**	1			
2.2. Psychological facet	-.37**	-.23**	-.26**	-.40**	-.12**	.87**	.62**	1		
2.3. Social relationships	-.34**	-.19**	-.26**	-.36**	-.07	.85**	.63**	.73**	1	
2.4. Environment	-.35**	-.15**	-.34**	-.38**	-.04	.93**	.68**	.71**	.74**	1
Mean	1.96	1.87	2.27	1.74	1.96	3.72	3.65	3.92	3.94	3.51
SD	.58	.98	0.99	.72	.93	.73	.73	.80	.97	.89

***p <.01*

The results from Table 1 show that stress caused by WPC, WCL, and WIS all negatively impact quality-of-life variables, with correlation coefficients ranging from -0.45 to -0.12, $p < 0.01$. However, stress from RIW only has a statistically significant negative relationship ($p < 0.01$) with psychological health. At the same time, it does not have a significant correlation with other aspects of quality of life.

Additionally, Table 1 indicates that firefighters' overall occupational stress level is low, with a mean score of 1.96 (SD = 0.58). Among the stress factors, stress from WCL had the highest mean score (M = 2.27, SD = 0.99), while WIS had the lowest mean score (M = 1.74, SD = 0.72).

For quality of life, firefighters scored a mean of 3.72 (SD = 0.73). The quality of social relationships had the highest mean score (M = 3.94, SD = 0.97), followed by the environment (M = 3.51, SD = 0.89).

Impact of occupational stress on firefighters' quality of life

Simple regression analysis was used to determine the exact contribution of occupational stress to the criterion of firefighters' quality of life. The results of the regression analysis showed that the models were statistically significant ($p < 0.01$). The simple regression result is represented in the model: Quality of life = 4.75 - 0.42 job stress

The model indicates that occupational stress has a significant negative impact on the quality of life ($\beta = -0.42$, $p < 0.01$). Approximately 17.7% of the variance in quality of life could be explained by this factor, R^2=.177, F = 107.9, $p < .001$. This means that for each extra unit change in job stress, the quality of life would decrease 0.42.

To determine the precise contribution of each source of job stress to firefighters' quality of life, Table 2 displays the results of multivariate linear regression analysis on occupational stress affecting firefighters' overall quality of life. The results indicated that the models were statistically significant ($p<0.05$). No multicollinearity was detected (tolerance > 0.5, VIF < 2.0), and there was no autocorrelation (Durbin-Watson statistics ranging from 1.35 to 1.58). Consequently, there was no evidence of multicollinearity or autocorrelation among sources of job stress. These findings confirm that all models provide a suitable fit to the data.

Table 2. *Multivariate linear regression to predict firefighters' quality of life*

Dependent Var	Independent Var (Sources of Job Stress)	B	SE	β	t	F	R^2
Overall quality of life	(Constant)	4.70	.10		45.57**	34.45	0.217
	WPC	-.06	.03	-.08	-1.84		
	WCL	-.09	.04	-.12	-2.59*		
	WIS	-.36	.05	-.35	-7.19**		
	RIW	-.02	.03	-.03	-.68		
1. Physical health	(Constant)	4.59	.10		44.37**	30.25	.093
	WPC	-.07	.03	-.09	-2.19*		
	WCL	-.09	.04	-.12	-2.46*		
	WIS	-.32	.05	-.32	-6.43**		
	RIW	-.03	.03	-.03	-.80		
2. Psychological health	(Constant)	4.91	.11		43.21**	27.37	.177
	WPC	-.09	.04	-.11	-2.61**		
	WCL	-.01	.04	-.01	-.28		
	WIS	-.39	.06	-.35	-7.13**		
	RIW	-.06	.04	-.07	-1.61		
3. Social relationships	(Constant)	4.97	.14		35.34**	20.49	.131
	WPC	-.07	.04	-.07	-1.68*		
	WCL	-.07	.05	-.07	-1.36		
	WIS	-.40	.07	-.30	-5.87**		
	RIW	-.03	.04	-.02	-.58		
4. Environment	(Constant)	4.48	.13		35.07**	25.60	0.168
	WPC	-.01	.04	-.01	-.32		
	WCL	-.14	.04	-.16	-3.30**		
	WIS	-.37	.06	-.29	-5.92**		
	RIW	.01	.04	.01	.25		

**p<.05, **p<.01*

In the overall quality of life model, the regression results indicated that the sources of occupational stress significantly predicted quality of life. About 21.7% of the variation in quality of life could be explained by these sources ($R^2 = 0.217$; $F = 34.45$; $p < 0.01$). Among these predictors, stress from WCL, as well as WIS, statistically and significantly predicted quality of life. However, stress from WPC, as well as RIW, did not predict quality of life, with $p > 0.05$. When considering each aspect of quality of life, there are several differences across the models.

In Model 1, 9.3% of the variance in the physical facet can be explained by sources of job stress ($R^2 = 0.093$; $p < 0.05$). All these predictors significantly predicted to decrease firefighters' physical domain ($p < 0.01$), except for stress from RIW, $p>0.05$.

In model 2, the results showed that 17.7% of the variance in the psychological facet could be explained by sources of occupational stress ($R^2 = .177$; $p < 0.05$), including stress from WPC, as well as WIS, which had negative effects ($\beta = - 0.11$, $\beta = - 0.35$, respectively). Stress from WCL, as well as stress from RIW, did not impact the subscale ($p > 0.05$).

In Model 3, 13.1% of the variance in social relationships can be explained by sources of occupational stress ($R^2 = 0.131$; $p < 0.05$). In this model, sources of stress from WPC, WIS significantly predicted a decrease in firefighters' quality of social relationships ($p < 0.05$).

In terms of Model 4, the results show that approximately 16.8% of the variance in environment could be explained by these sources of occupational stress ($R^2 = 0.168$; $p < 0.01$). Among these predictors, stress from WCL, WIS are predicted to decrease firefighters' environmental quality ($p < 0.05$),

It can be seen in the overall model and the four models for each aspect of quality of life, stress from workplace hazards, and inequality did not correlate with firefighters' quality of life, while stress, coworker relationships, and social isolation emerged as the most significant predictors of a decline in firefighters' quality of life.

Discussion

The current study shows that occupational stress negatively affects four aspects of firefighters' quality of life: physical health, psychological health, social relationships, and the living environment. This confirms hypotheses H1, H2, H3, H4, and H5. These findings are consistent with the study by Lim et al. (2014), which highlights that work stressors, such as pressure from emergencies and interpersonal conflicts, lead to increased symptoms of depression and sleep disorders among firefighters. Supporting our results, Jang et al. (2020) also found a significant link between occupational stress levels and firefighters' quality of life, indicating that higher stress corresponds with a decline in overall well-being. Moreover, individuals experiencing high stress levels have been reported to have poorer health overall (Jang et al., 2020). Yook (2019) also noted that occupational stress could lower sleep quality, which negatively affects firefighters' cognitive functions and health.

The influence of occupational stress on quality of life can be explained using the "Job Demands-Resources Model" (Demerouti et al., 2001). According to this model, firefighters experience stress when they lack enough job resources to handle the demanding requirements of their work. This can deplete both their physical and mental resources, leading to stress and other health problems. In practice, the staffing levels in the Fire Prevention and Rescue Police force currently do not meet the practical demands of their duties. The personnel shortage in many units forces firefighters to be on duty continuously, which negatively affects their health and job performance. Many studies report that firefighters often experience sleep disorders, contributing to higher stress levels and negatively impacting their health, such as hypertension and an increased risk of cardiovascular diseases (Choi et al., 2016). Furthermore, some experts suggest that the high physical demands of firefighting tasks can significantly wear down firefighters' bodies, ultimately affecting their overall work performance and ability to manage stress (Jang et al., 2019). Additionally, although firefighting equipment has been upgraded and supplemented in recent years, it remains insufficient to meet practical demands (Quynh, 2021). On the other hand, due to the unique nature of rescue work, firefighters not only have to train intensely but also often face dangerous situations and are exposed to traumatic accidents. These issues make them highly vulnerable to psychological trauma, stress, burnout, and other health-related problems.

A new finding in our study is that stress from WIS - such as conflicts with coworkers, team members, or feelings of isolation from family due to work demands - is the strongest factor affecting and reducing all aspects of quality of life. The results of this study align with previous research (Kazronian et al., 2013; Geuzinge et al., 2020), where community, family, and colleague relationships can serve as a buffer, helping firefighters cope with the negative effects of job stress. This can be explained by the fact that firefighters feel their colleagues understand their experiences better than those who are not firefighters, making them feel "understood" (Jeannette & Scoboria, 2008; Isaac & Buchana, 2021). Therefore, firefighters' quality of life declines when they lack strong relationships with colleagues. Additionally, Vietnamese culture is fundamentally community-oriented. As a result, interpersonal relationships at work and within the family are crucial sources of emotional support for Vietnamese workers, helping them manage occupational challenges and stress to improve their quality of life. However, when firefighters experience stress from these sources, it can significantly diminish their overall quality of life.

Conclusion

The current study provides additional evidence of the negative impact of occupational stress on the quality of life of firefighters in which stress coworker relationship stress and social isolation emerging as the most significant predictors of a decline in their well-being.

A supportive work environment that encourages help-seeking behavior is crucial in mitigating the impact of stress and enhancing firefighters' quality of life. Establishing a social environment to enhance psychological well-being helps increase access to support resources and fosters teamwork and employee cohesion. Activities that foster strong colleague relationships can serve as a protective factor, reducing occupational stress while enhancing job satisfaction and overall quality of life for firefighters.

Additionally, organizations need to adjust the work environment, compensation systems, task delegation mechanisms, and mental health support to alleviate pressure on employees. Specifically, appropriate measures should be implemented to improve working conditions and achieve a work-life balance, which would contribute to enhancing the quality of life and job performance of firefighters.

Declarations

Ethics Committee Approval
Ethical approval obtained from the Human Research Committee of the University of Social Sciences and Humanities, Vietnam National University, Hanoi, 16.12.2024, with Protocol No. 6933. Prior to their participation, all participants were provided with and approved informed consent forms.

Consent for Publication
Not applicable

Availability of Data and Materials
Not applicable

Competing Interests
The author declares that no competing interests in this manuscript

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Authors' Contributions
L.T.M.L carried out the proposal of the main idea of the research and article writing. N.T.T contributed to data analysis and technical and material support. Both authors carried out the collection of data, interpretation, revision of manuscript and have read and approved the final article.

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