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Perceived supervisor support and job stress among firefighters in Vietnam: examining the mediating role of psychological capital

BACKGROUND
Firefighters are at particularly high risk of job stress (JS), which can lead to serious physical and psychological problems as well as impaired job performance. Perceived supervisor support (PSS) and psychological capital (PsyCap) have been shown to be associated with JS. However, to date, no study has simultaneously examined the relationships among these variables, especially within the firefighting context. Therefore, this study aimed to investigate whether PsyCap mediates the relationship between PSS and JS among Vietnamese firefighters.

PARTICIPANTS AND PROCEDURE
Of the 535 questionnaires distributed to Vietnamese firefighters, 517 valid responses were retained for analysis. Participants (M_{age} = 30.7 years, SD_{age} = 5.0) completed an anonymous self-report questionnaire assessing PSS, PsyCap, and JS. Data were analyzed using partial least squares structural equation modeling (PLS-SEM).

RESULTS
PSS was negatively associated with JS (β = –.27, p < .001) and positively associated with PsyCap (β = .61, p < .001). PsyCap was negatively associated with JS (β = –.17, p = .007). Furthermore, PsyCap significantly mediated the relationship between PSS and JS (β = –.10, p = .007), supporting all proposed hypotheses.

CONCLUSIONS
The findings highlight the role of PSS in reducing JS among firefighters through the enhancement of PsyCap. These results suggest practical implications for developing effective strategies to mitigate work-related stress by enhancing supportive supervisory practices and fostering firefighters' PsyCap as a sustainable personal resource for coping with occupational demands.

KEY WORDS
perceived supervisor support; psychological capital; job stress; firefighters

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BACKGROUND

Job stress (JS) is increasingly recognized as a worldwide concern, impacting workers across sectors in both developed and developing nations (International Labour Organization, 2016). Certain occupations experience particularly high levels of JS, with firefighting as a prominent example (Soteriades et al., 2022). Research has identified multiple sources of stress among firefighters, including organizational demands (e.g., staffing shortages, inadequate pay, and demanding shifts), operational demands (e.g., exposure to hazardous and unpredictable emergencies), interpersonal pressures (e.g., work-life imbalance and fear of mistakes), along with policy-related factors (e.g., changes in pension systems and funding constraints) (Duran et al., 2018; Rajabi et al., 2020). Together, these overlapping demands create a persistently high-stress work environment for firefighters.

JS has been linked to a wide range of adverse physical and psychological outcomes among firefighters. Given the nature of their work, firefighters are routinely exposed to high-intensity traumatic situations (Sahebi et al., 2020). Such repeated exposure, along with other operational and organizational stressors, has been associated with an increased risk of developing post-traumatic stress disorder (PTSD) (Langtry et al., 2021; Serrano-Ibáñez et al., 2023). Additionally, firefighters may experience secondary traumatic stress (STS) through their efforts to assist individuals who have undergone traumatic experiences (Greinacher et al., 2019).

Beyond trauma-related outcomes, JS is strongly associated with burnout (García-Iglesias et al., 2025), which in turn undermines safety-related behaviors, including adherence to procedures, use of protective equipment, and effective communication (Smith et al., 2018). Elevated stress levels are further linked to increased suicide risk (Stanley et al., 2018) and a higher incidence of occupational injuries (Kim et al., 2016). Collectively, these findings suggest that JS not only diminishes individual well-being but also compromises operational safety and organizational effectiveness.

Regarding physical health, stress experienced in the workplace has been associated with musculoskeletal symptoms, particularly when combined with PTSD (Khoshakhlagh et al., 2024). In addition, key dimensions of JS – such as high effort, effort-reward imbalance, and overcommitment – significantly increase the risk of sleep disturbances (Chin et al., 2023). Other health problems have also been linked to JS in this occupation, including alcohol use disorders, cardiovascular conditions, and gastrointestinal problems (Igboanugo et al., 2021).

While these challenges have been widely documented globally, firefighting in Vietnam is similarly characterized by frequent emergency deployments and high operational demands (Luu Ly, 2021). This context is reflected in national statistics, with 1,710 fires recorded in the first half of 2025, resulting in substantial human, economic, and environmental losses (Fire Prevention and Rescue Police Department, 2025). Occupational risk is further evidenced by line-of-duty fatalities among firefighters, with 34 deaths reported to date, 10 of which occurred between 2017 and 2023 (Minh Hien, 2023). Overall, these data indicate that firefighting in Vietnam involves substantial occupational hazards and operational demands that may contribute to JS, highlighting the need to identify key factors that may help mitigate JS among firefighters.

PERCEIVED SUPERVISOR SUPPORT AND JOB STRESS

Stress arises when individuals perceive that the demands of an external circumstance exceed their perceived capacity to manage (Lazarus, 1966). In the workplace, JS arises when environmental demands exceed (or threaten to exceed) a person's capabilities and resources to address them, or when the person's needs are not met by the job environment (Schuler, 1980). Within this context, supervisors play a key role as they directly influence the working conditions and influence employees' well-being (Hämmig, 2017; Nabawanuka & Ekmekcioglu, 2022). Supervisors are first-level managers who coordinate tasks, provide guidance, and evaluate employees' job performance.

Perceived supervisor support (PSS) refers to employees' beliefs that their supervisors value their contributions to the organization and care about their well-being (Eisenberger et al., 2002). Greater PSS is associated with reduced JS (McGilton et al., 2007). Research shows that supervisors reduce JS by offering emotional reassurance and providing information employees need to navigate their jobs. Clear communication, guidance, and constructive feedback help reduce role ambiguity and prevent employees from feeling overwhelmed by unclear expectations, thereby strengthening their sense of personal accomplishment and improving job performance (Chen et al., 2012; Park & Choi, 2020). Additionally, supervisors who offer reassurance, open communication, and understanding can help employees better manage the emotional demands of their jobs. This can help reduce emotional exhaustion (Willemse et al., 2012), psychological distress (Tu et al., 2023), burnout (Hämmig, 2017), and lower the risk of anxiety or depressive symptoms (Oh et al., 2021), as well as PTSD in firefighters (Saijo et al., 2012).

Altogether, these enable employees to appraise work demands as more manageable, ultimately lowering their overall JS. Consistent evidence across multiple occupational settings highlights the importance of supervisor support, especially in highly demanding

occupations such as police officers (Kula, 2017) or registered nurses (Chami-Malaeb, 2022).

In Vietnam, fire prevention, firefighting, and rescue activities are governed by the Law on Fire Prevention, Firefighting and Rescue No. 55/2024/QH15 and related regulations. The system is organized into three levels: central, local, and grassroots. While central and local authorities provide oversight, guidance, and periodic inspection, supervision is most direct at the grassroots level, where early detection and response to incidents take place. At this level, the captain serves as the direct supervisor. They are responsible for task assignment, monitoring safety compliance, and managing equipment, while also closely overseeing firefighters' performance. In emergencies, the captain takes command and coordinates personnel and resources at the scene. They also play a key role in organizing training and drills to maintain operational readiness. Given these combined managerial and operational responsibilities, the captain represents the most immediate source of supervisory support. In this study, this role is conceptually aligned with the notion of a "supervisor".

THE MEDIATING ROLE OF PSYCHOLOGICAL CAPITAL

Psychological capital (PsyCap) was first introduced by Luthans and colleagues (2007) as a higher-order construct in positive organizational behavior, reflecting developable psychological resources that enhance performance and well-being. It comprises four interrelated dimensions: self-efficacy, hope, optimism, and resilience. PsyCap is state-like rather than trait-like, meaning it can be developed, and its components function most effectively when integrated (Avey et al., 2009; Luthans et al., 2007).

There are various resources that contribute to the development of PsyCap, among which PSS is considered an important environmental resource. When employees feel supported and recognized by their supervisors, they are more likely to develop positive psychological resources. Although the relationship between PSS and PsyCap has not received much attention, some evidence suggests a positive association. For example, a study in the insurance industry in Taiwan by Liu (2013) found a strong correlation between PSS and PsyCap, and PsyCap was also closely related to job performance. In the field of mental health, PsyCap has been demonstrated to function as a mediator in the correlation between supervisor support and employees' psychological well-being. Similarly, another study examining perceived supervisor support, psychological capital, and employee well-being also found that PsyCap fully mediated the association between supervisor support and well-being levels (Yin & Wu, 2023).

Research on the relationship between PsyCap and JS has mainly focused on general employee groups, with limited attention to high-risk occupations. In the tourism sector, PsyCap was negatively correlated with JS, explaining about 16% of its variance (Çelik, 2018). Similarly, a study in the hotel sector found a significant negative effect of PsyCap on JS (Li et al., 2021). These findings align with evidence showing that PsyCap is associated with lower stress symptoms, which in turn reduce adverse outcomes such as turnover intention and job search behaviors (Avey et al., 2009). Overall, cross-sectional studies suggest that higher PsyCap is linked to lower job-related stress. Moreover, an experimental study among telecommunications employees demonstrated that PsyCap can be improved through interventions, leading to reduced stress levels (Patnaik et al., 2022). This highlights PsyCap as a practical approach to enhancing employee well-being.

From a theoretical perspective, this study draws on two main theoretical models to explain and frame the proposed relationships. First, we adopt the Job Demands-Resources (JD-R) model (Bakker et al., 2003; Demerouti et al., 2001), which suggests that employees' well-being depends on the balance between job demands and job resources. Within this framework, PsyCap is regarded as a crucial personal resource that supports positive psychological functioning in the workplace. Higher levels of PsyCap components (self-efficacy, hope, optimism, and resilience) correlate with enhanced well-being, highlighting their positive role in maintaining employees' psychological health. Second, the Conservation of Resources (COR) theory (Hobfoll, 1989, 2002) is applied, emphasizing that individual well-being depends on the availability of valued resources. From this perspective, PsyCap represents a set of essential psychological resources that are closely linked to positive mental states. Employees with higher levels of PsyCap tend to experience greater well-being, as these psychological resources support stable and positive functioning at work. Together, these frameworks support the proposed mediation mechanism, in which PSS, as a job resource, reduces JS both directly and indirectly through the development of PsyCap. This highlights the complementary roles of job and personal resources in shaping stress-related outcomes.

THE PRESENT RESEARCH

Although PSS has been widely examined, relatively few recent studies have focused specifically on JS as an outcome compared with related outcomes such as burnout (Chami-Malaeb, 2022) or well-being (Nabawanuka & Ekmekcioglu, 2022). Furthermore, existing research emphasizes the impact of perceived organizational support on PsyCap (Liu, 2013; Yin

& Wu, 2023), leaving the specific role of supervisors largely unexplored. Additionally, while empirical investigations into PsyCap have mainly concentrated on its connections to burnout (Liu et al., 2021) or its potential to predict JS (Yao et al., 2022), the direct influence of PsyCap on JS among firefighters has received little attention (Avey et al., 2009; Çelik, 2018; Li et al., 2021).

As a result, there is still limited understanding of the psychological mechanism through which supervisory support reduces JS. These gaps are crucial in high-risk jobs like firefighting, where workers face constant trauma and strict job demands. Yet to our knowledge, no study has investigated the structural relationships among PSS, PsyCap, and JS, particularly in firefighter settings or within the context of Vietnam. The unique cultural and working conditions may influence how these variables interact. This highlights the need for research on both the direct and indirect pathways through which PSS influences JS via PsyCap, with the aim of informing recommendations to reduce JS among firefighters.

In this study, we proposed the following hypotheses:

H1: PSS negatively and significantly affects job stress.

H2: PSS positively and significantly affects PsyCap.

H3: PsyCap negatively and significantly affects job stress.

H4: PsyCap mediates the relationship between PSS and JS.

The research model developed from the assumptions is illustrated in Figure 1.

PARTICIPANTS AND PROCEDURE

PARTICIPANTS

The participants of this study were active firefighters serving across Vietnam. According to the Vietnam Fire Prevention and Rescue Police Department, there were 6,882 active-duty firefighters nationwide in 2024. The required sample size was calculated using Yamane's formula (1967, as cited in Ahmed, 2024). With a 5% margin of error, at least 378 participants were needed. To improve the representativeness of the sample, 535 firefighters from across Vietnam were invited to participate in the survey. The sociodemographic characteristics of the sample broadly reflected the demographic profile of the Vietnamese firefighting workforce, highlighting the relevance and reliability of our sample.

The sample comprised 2.6% females and 97.4% males, with a mean age of 30.7 years (SD = 5.0). Most participants were married (63.5%), while 35.2% were unmarried. A small proportion were divorced (0.8%) or reported other marital statuses (0.6%). Regarding years of service, 14% had worked for less than 6 years; 35.5% for 6-10 years; 41.2% for 10-15 years; 8.8% for 15-20 years; and 0.4% for more than 20 years. Participants also reported engaging in professional training fairly often (M = 3.80, SD = 0.78). The predominance of male participants reflects the traditionally male-dominated nature of firefighting in Vietnam due to its physically demanding and high-risk nature.

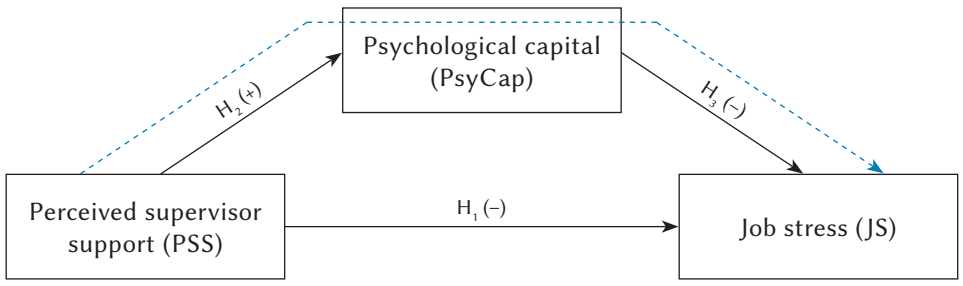
MEASURES

Sources of Occupational Stress scale (SOOS-14). JS was measured using the 14-item Sources of Occupational Stress scale (SOOS-14; Kimbrel et al., 2011), a shortened version of the original SOOS by Beaton and Murphy (1993). All items were rated on a 5-point Likert scale from 1 (*never*) to 5 (*very often*). Total scores were calculated as the mean of all items, with higher values indicating higher levels of JS. According to Kimbrel et al. (2011), the SOOS-14 exhibited strong reliability and validity in firefighter samples. In the present study, the Vietnamese version demonstrated good internal consistency (α = .79).

Supervisory Support Measure (SSM). The Supervisory Support Measure (SSM; Greenhaus et al., 1990)

Figure 1

Research model



Note. ⟶ Direct effect ⇢ Indirect effect

is a 9-item self-report scale for assessing employees' perceived support from their supervisor in the workplace. Items are on a 5-point Likert scale from 1 (*strongly disagree*) to 5 (*strongly agree*). All items are reverse-coded; therefore, responses must be recoded before analysis (e.g., a response of "strongly agree" is scored as 1 instead of 5). Higher total scores indicate greater perceived supervisory support. The Vietnamese version was used in this research and showed good internal consistency in the present sample ($\alpha = .90$), confirming its suitability.

The Psychological Capital Questionnaire – 12 items (PCQ-12). The Psychological Capital Questionnaire (PCQ-12), a shortened form of the PCQ-24 (Avey et al., 2011), was used to evaluate psychological capital. The scale includes 12 items that address hope, self-efficacy, resilience, and optimism, modified to capture participants' perceptions "at work" and "right now." Items were rated on a 5-point Likert scale from 1 (*strongly disagree*) to 5 (*strongly agree*), adapted for firefighters. PsyCap scores were determined by calculating the mean of all items, with elevated scores signifying greater psychological capital.

DATA COLLECTION PROCEDURE

This study adopted a quantitative design, with data collected through a self-reported questionnaire. Before data collection, ethical approval was obtained from the Ethics Committee of the University of Social Sciences and Humanities, Vietnam National University, Hanoi. The participant recruitment process was conducted in two stages. First, formal letters requesting permission to conduct the survey were sent to the Fire Prevention, Fighting, and Rescue Police Departments (or equivalent units) under the Public Security forces in major Vietnamese cities and provinces, including Hanoi, Ho Chi Minh City, Can Tho, and Da Nang. After receiving approval from these units, the researchers proceeded to invite firefighters to participate in the study.

This study used a convenience sampling method to select participants based on their availability and willingness to participate in the survey. Specifically, firefighters who were present and accessible during the survey period were invited to take part. Written informed consent was obtained before participation. Participation was voluntary, and participants could withdraw at any time without penalty, particularly if they experienced discomfort or distress from the content of the questionnaire or if the study prompted memories of past traumatic events related to their work. To ensure confidentiality, no identifying information was collected, and all responses were anonymized and used solely for research purposes. Data collection began in January 2025, after all consent procedures had been completed.

DATA ANALYSIS STRATEGY

A reflective-reflective hierarchical research approach was employed for data analysis. According to Hair et al. (2021), partial least squares structural equation modeling (PLS-SEM) was chosen over covariance-based structural equation modeling (CB-SEM) because the study focuses on prediction and incorporates higher-order constructs (HOC), which PLS-SEM is particularly suited to due to its capacity to model complicated interactions without tight distributional assumptions (Sarstedt et al., 2019). Due to the existence of a second-order reflective construct and an uneven distribution of indicators in lower-order reflective constructs, the present study employed a discontinuous two-stage methodology using Model A for evaluation (Hair et al., 2021; Sarstedt et al., 2019). The required minimum sample size of 110 was computed using the recommendations established by Hair and Alamer (2022), which assume 80% statistical power and a 5% significance level. To validate the proposed research model, structural equation modeling was used. This method is ideal for estimating complex causal links between variables and can produce a high level of statistical power (Hair et al., 2014).

Data analysis was conducted using SmartPLS to validate the proposed structural model. The analysis examined the correlations among PSS, PsyCap, and JS as identified in the literature review. The proposed relationships were investigated and the study's research aims were evaluated using statistical approaches such as path and mediation analyses. The research employed Cronbach's alpha and composite reliability (CR) to evaluate internal consistency, whereas outer loadings and average variance extracted (AVE) were used to determine convergent validity.

RESULTS

MEASUREMENT MODEL OF REFLECTIVE CONSTRUCTS

The measurement model was assessed for reliability and convergent validity following the criteria established by Hair et al. (2014, 2021). As presented in Table 1, all constructs, including the four lower-order components of PsyCap (hope, self-efficacy, resilience, and optimism) as well as PSS and JS, demonstrated satisfactory Cronbach's alpha ($\alpha > 0.7$), composite reliability ($CR > 0.7$), and average variance extracted ($AVE > 0.5$), confirming adequate internal consistency and convergent validity across both first-order and second-order constructs.

The assessment of discriminant validity was conducted using the Fornell-Larcker criterion (Fornell & Larcker, 1981) alongside the heterotrait-monotrait

Table 1

Convergent validity and reliability of the measurement model

Constructs	Cronbach's α	Composite reliability (ρa)	Composite reliability (ρc)	Average variance extracted (AVE)
PSS	.93	0.94	0.95	0.69
PsyCap	.94	0.95	0.95	0.62
Optimism	.87	0.87	0.94	0.88
Self-efficacy	.90	0.90	0.94	0.83
Hope	.88	0.88	0.92	0.74
Resilience	.84	0.85	0.90	0.76
JS	.88	0.88	0.90	0.51

Note. PSS – perceived supervisor support; PsyCap – psychological capital; JS – job stress.

Table 2

HTMT ratios, correlations, and discriminant validity (Fornell-Larcker criterion)

No.	Construct	HTMT ratio		Fornell-Larcker criterion		
		1	2	1	2	3
1	JS			**0.71**		
2	PsyCap	0.37		−0.33	**0.79**	
3	PSS	0.41	0.65	−0.37	0.61	**0.83**

Note. PSS – perceived supervisor support; PsyCap – psychological capital; JS – job stress.

(HTMT) ratio (Hair et al., 2014). Table 2 shows that the square root of the AVE for each construct on the diagonal exceeds its correlations with all other constructs, satisfying the Fornell-Larcker criterion for discriminant validity. Additionally, the HTMT values across the constructs vary from 0.37 to 0.65, all below the conservative threshold of 0.85 (Hair et al., 2017). Furthermore, the upper limit values of the HTMT confidence intervals were all below 1.00. These results provide evidence of adequate discriminant validity.

HYPOTHESIS TESTING AND ANALYSIS

Bootstrapping methods were used to assess the route coefficients of the constructions. The path coefficient value varies from 1 to +1, with more robust predictive correlations associated with larger absolute values. Hair et al. (2011) suggest that, for a two-tailed test, a *t*-value greater than 1.96 and a *p*-value below .05 indicate that a path coefficient is statistically significant. Table 3 and Figure 2 present the findings of the structural model derived from a bootstrapping method using 5,000 resamples.

As shown in Table 3, PSS had a negative effect on JS (β = −.27, $p < .001$) and a positive effect on PsyCap (β = .61, $p < .001$). PsyCap had a significant negative effect on JS (β = −.17, $p < .01$). Therefore, Hypotheses 1, 2, and 3 are supported.

According to Geisser (1974), the blindfolding method was employed to evaluate the predictive validity of the structural model. Table 4 shows that the Stone-Geisser (Q^2) values for JS and PsyCap were 0.132 and 0.370, respectively, both exceeding the threshold of zero. These results indicate that the model has predictive relevance for both endogenous constructs. The Q^2 value suggests moderate predictive relevance for JS and stronger predictive relevance for PsyCap. Therefore, the model demonstrates adequate predictive relevance. Moreover, the adjusted R^2 values for PsyCap and JS were .374, .157, respectively. These results indicate that the model explained 37.4% of the variation in PsyCap and 15.7% of the variation in JS.

Table 5 presents the mediating influence of PsyCap in the relationship between PSS and JS. A bootstrapping procedure was performed to test the indirect effect using PLS-SEM (two-tailed, *t*-value > 1.96, *p*-value < .05). The results showed that the indirect effect of PSS on JS through PsyCap was statistically significant (β = −.10, $p = .007$) supporting the mediating role of PsyCap.

The structural relationships and standardized coefficients of the proposed model are summarized in Figure 2.

Table 3

Results of path coefficient (direct effect)

Hypothesis	Path	Original sample (O)	Sample mean (*M*)	Standard deviation (*SD*)	*t*	*p*	Decision
H1	PSS → JS	−0.27	−0.27	0.06	4.75	< .001	Supported
H2	PSS → PsyCap	0.61	0.61	0.03	19.11	< .001	Supported
H3	PsyCap → JS	−0.17	−0.17	0.06	2.71	< .01	Supported

Note. PSS – perceived supervisor support; PsyCap – psychological capital; JS – job stress.

Table 4

R-square adjusted and Q²predict

Construct	R^2 adjusted	Q²predict	RMSE	MAE
JS	.157	0.132	0.935	0.751
PsyCap	.374	0.370	0.797	0.626

Note. PsyCap – psychological capital; JS – job stress; RMSE – root mean square error; MAE – mean absolute error.

Table 5

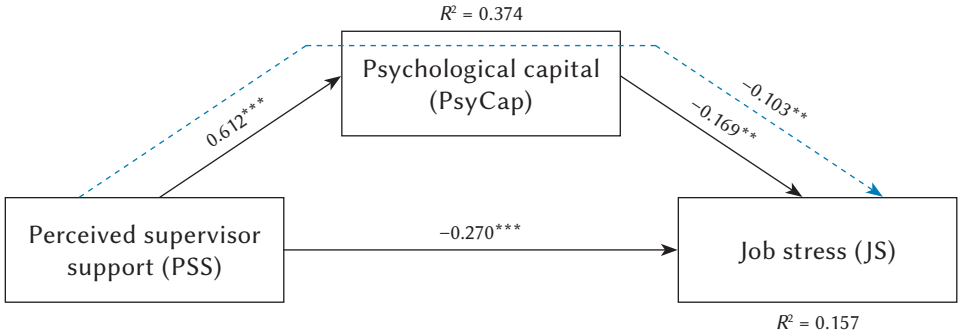
Results of the mediation analysis

Hypothesis	Path	Original sample (O)	Sample mean (*M*)	Standard deviation (*SD*)	*t*	*p*	Decision
H4	PSS → PsyCap → JS	−0.10	−0.10	0.04	2.72	.007	Supported

Note. PSS – perceived supervisor support; PsyCap – psychological capital; JS – job stress.

Figure 2

Mediating effect of PsyCap on the relationship between PSS and JS



Note. $^{**}p < .01$, $^{***}p < .001$; R^2 – squared multiple correlation; ----➤ statistically significant mediation paths.

DISCUSSION

The study supported all four hypotheses, indicating that PSS and PsyCap significantly impact JS among firefighters, with PsyCap acting as a mediating variable. These results contribute to the limited literature on PSS and JS in firefighters by demonstrating that higher PSS not only directly reduces JS but also enhances firefighters' internal psychological resources. In detail, this study showed that PSS has a significantly negative effect on JS among firefighters, aligning with earlier evidence showing that supportive supervisors can help reduce stress levels in frontline occupations (McGilton et al., 2007). This finding can be understood through the Cognitive Appraisal Theory of Stress (Lazarus & Folkman, 1984), which proposes that stress arises when individuals evaluate job demands as exceeding their coping resources. Super-

visor support can directly influence these appraisals and strengthen firefighters' ability to cope, helping them view high-pressure situations as less threatening. Furthermore, this relationship is consistent with broader literature suggesting that supervisors shape employees' cognitive and emotional responses to work demands by reducing uncertainty and easing emotional tension, therefore helping employees interpret challenging situations as more manageable (Hämmig, 2017; Park & Choi, 2020; Tu et al., 2023). Although having described these mechanisms, existing studies do not solely focus on JS itself. Therefore, the present study adds updated and direct evidence that highlights the importance of supervisor support as a protective resource against JS.

The results also show that PSS is positively associated with PsyCap. This means that when employees receive greater attention, guidance, and support from their supervisors, they are more likely to develop personal resources such as self-efficacy, adaptability, and a sense of control over their work environment. These findings align with prior research in several fields, such as those by Liu (2013) and Yin and Wu (2023), which similarly demonstrate that supervisor support significantly enhances PsyCap and promotes employees' well-being. PSS helps create a sense of emotional safety and reduces exhaustion, thereby enhancing positive psychological states such as hope and optimism. In addition, clear guidance, constructive feedback, and practical support from supervisors contribute to higher self-efficacy among employees, which is a core component of PsyCap. This is fully consistent with Bandura's (1997) argument that social support strengthens individuals' beliefs in their own abilities. In summary, these findings suggest that PSS functions as an important resource in promoting PsyCap, helping firefighters develop the personal strengths needed to cope effectively with demanding work conditions.

Research on PsyCap and JS has increasingly extended to high-risk occupational settings. Beyond the tourism and hospitality sectors (Çelik, 2018; Li et al., 2021), recent studies have demonstrated PsyCap's protective role in physically demanding industries. For example, self-efficacy is associated with lower levels of occupational stress, which in turn relates to lower burnout levels (Makara-Studzińska et al., 2019). In addition, resilience and hope have been differentially linked to stress-related consequences, with resilience showing stronger negative associations with PTSD, whereas hope has been more strongly and positively related to well-being and posttraumatic growth (Senger et al., 2023). Overall, these findings are consistent with the present finding that higher PsyCap is associated with lower JS among firefighters.

More specifically, the findings suggest that PsyCap may explain part of the association between PSS and JS. From the perspective of the Job Demands-Resources (JD-R) model, job resources such as supervisor support are essential in helping employees cope with work demands, limit emotional exhaustion, and sustain energy at work (Bakker et al., 2003; Demerouti et al., 2001). Through guidance, practical help, and socio-emotional support, supervisors can strengthen employees' sense of control and confidence in dealing with work challenges. When PsyCap is considered a core personal resource, it enables employees to mobilize both cognitive and emotional strengths to manage demanding job conditions. This process is consistent with the resource gain cycle proposed in Conservation of Resources (COR) theory (Hobfoll, 1989), whereby the accumulation of personal resources promotes further adaptation and resilience. Most recently, Saleem and colleagues (2025) extended this framework to the collective level, demonstrating that Collective PsyCap mitigated safety stressors and fostered positive safety cultures in oil and gas operations, a high-risk context structurally comparable to firefighting. Taken together, this growing body of evidence reinforces the proposition that PsyCap consistently buffers against stress-related outcomes across diverse and demanding occupational environments, providing a strong theoretical basis for the present study.

Urban conditions in Vietnam further intensify the JS experienced by firefighters. Vietnam's tropical monsoon climate, combined with ongoing climate change, has resulted in more extreme and less predictable weather patterns. Rising temperatures have led to more intense and prolonged heat waves, while rainfall has become heavier over shorter periods, increasing the risk of urban flooding (Nguyen Hoang, 2025). Storms and tropical depressions tend to be stronger, bringing heavier rain, while the dry season becomes arid, which raises the risk of residential fires (Bao Tien, 2025). These conditions increase both physical and psychological demands on firefighters. High temperatures accelerate physical exhaustion and reduce the amount of time firefighters can safely operate at fire scenes. Strong winds and dry weather conditions allow fires to spread rapidly and unpredictably, requiring faster and more intense responses. In contrast, heavy rain and flooding restrict access to sites, delay equipment deployment, extend operation time, and increase safety risks.

In addition to climatic challenges, urban structure in Vietnam creates further challenges. In many residential areas, especially in large cities, alleys are extremely narrow (often only about one meter wide). In some cases, the presence of a single motorbike can block access to emergency scenes (Den Phu, 2024). Specifically, the Old Quarter in Hoan Kiem District and several central areas of Hanoi are characterized by deep and narrow alleys, high population density, and tightly packed housing. Many of these have met-

al safety cages, commonly known as "tiger cages", which make rescue and evacuation more complex and increase operational risks (Minh Anh, 2024).

Under high-pressure conditions, supervisor support plays a critical role. This support may include daily mentoring, understanding individual firefighters' career goals and professional orientations; organizing training and job rotation to accumulate experience; providing opportunities for educational and training programs through flexible scheduling; offering timely and fair recognition through performance evaluation and commendation; and offering practical guidance related to both professional skills and physical recovery when difficulties arise. Such support can reduce overwhelming feelings while simultaneously fostering firefighters' PsyCap. Support from supervisors can strengthen self-efficacy, increase hope by helping firefighters understand how to act in specific work situations, nurture optimism regarding the meaningfulness of work, and promote resilience when facing danger. As PsyCap increases, firefighters are more likely to perceive JS as manageable, remain calmer in emergencies and recover more effectively from strain. Consistent with Warr's (1994) Vitamin Model, PsyCap may be conceptualized as a psychological resource that promotes well-being and helps buffer the adverse effects of occupational stress. In the context of firefighting in Vietnam, higher levels of PsyCap may help mitigate the negative impact of demanding and unpredictable work conditions on psychological functioning.

These findings highlight that job resources and personal resources work together, and that developing PsyCap may be an effective way to improve stress resilience and well-being among firefighters. By focusing on PsyCap, this study adds important practical implications, suggesting that strengthening PSS and PsyCap may help protect firefighters from excessive JS and support their long-term psychological functioning in demanding work environments.

This study has limitations. First, the cross-sectional nature of this study limits causal interpretation among PSS, PsyCap, and JS. Future research should adopt a longitudinal approach to better examine these relationships. Second, data were collected using self-report questionnaires, which may lead to response bias and increase the risk of common method variance. Participants may not have fully reflected their actual experiences or may have provided socially desirable responses. Future studies could incorporate multiple data sources or longitudinal designs to minimize these limitations. Third, the study focused solely on Vietnamese firefighters, which limits generalizability. Future studies could include participants from a wider range of sectors and countries, using the same model to compare findings. Fourth, potential confounding variables such as gender, educational level, job position, working region, years of service, marital status, and level of training were not controlled. Notably, seniority and workload may also affect JS and PsyCap, as more experienced firefighters may have better coping skills, while higher workload may increase JS and deplete psychological resources. Future research should incorporate these variables as covariates to enhance the explanatory power and precision of the model. Finally, the research model focused only on the mediating role of PsyCap. Future research could include other forms of support, such as social support, organizational support, and coworker support, and examine more comprehensive mediation models involving PsyCap, PSS, and JS.

CONCLUSIONS

The present study expands the understanding of JS in the life-threatening and high-demanding work environment of firefighters by demonstrating the mediating role of PsyCap in the relationship between PSS and JS. By identifying PsyCap as a potential psychological pathway through which supervisory support reduces JS, this study provides evidence regarding the mechanisms underlying JS management in high-pressure occupations. These findings contribute to the broader literature by highlighting how both job resources (such as PSS) and personal resources (such as PsyCap) jointly shape firefighters' stress responses.

These findings can inform human resource management strategies and organizational interventions in firefighting contexts. In particular, enhancing PSS through clear task guidance, constructive feedback, emotional reassurance, and dependability can help build and strengthen employees' PsyCap. Higher levels of PsyCap enable firefighters to cope effectively with demanding and stressful situations, reduce emotional exhaustion, and foster a greater sense of competence and accomplishment in challenging work environments.

Moreover, specialized training and development programs that focus on developing PsyCap such as self-efficacy, resilience, optimism, and hope can serve as sustainable interventions for maintaining mental health and improving operational readiness. Integrating these into organizational practices can help firefighters maintain stable mental health and long-term well-being while simultaneously improving effectiveness and resilience in the workplace.

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