https://doi.org/10.35845/kmuj.2025.23803

ORIGINAL ARTICLE

Emotional exhaustion, psychological capital, and psychological well-being among rescue workers: a mediation analysis

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Date Submitted: October 06, 2024

Date Revised: November 21, 2025

Date Accepted: November 25, 2025

ABSTRACT

Objectives: To examine the impact of emotional exhaustion on psychological well-being and to investigate the mediating role of psychological capital among rescue service providers.

Methods: This correlational study was conducted from May to August 2023 among rescue workers in South Punjab, Pakistan. Using purposive convenience sampling, 206 active-duty rescue personnel aged 20-40 years were included. Emotional exhaustion was assessed using the Maslach Burnout Inventory–Emotional Exhaustion subscale, psychological capital with the Psychological Capital Questionnaire (PCQ-12), and psychological well-being with the WHO-5 Well-Being Index. Data were analyzed using SPSS version 27. Pearson correlation analysis was performed, followed by mediation analysis using Hayes' PROCESS macro (Model 4) with 5,000 bootstrap samples.

Results: Out of 206 participants, 195 (95%) were males and 11 (5%) were females. Mean age of participants was 27.26±4.77 years. Emotional exhaustion showed a significant negative association with psychological well-being ($r = -0.60$, $p<0.001$) and psychological capital ($r = -0.38$, $p <0.001$). Psychological capital was positively correlated with psychological well-being ($r=0.43$, $p<0.001$). Mediation analysis revealed that emotional exhaustion had a significant direct negative effect on psychological well-being ($\beta = -0.51$, $p<0.001$). Additionally, emotional exhaustion exerted a significant indirect effect on psychological well-being through psychological capital ($\beta = -0.09$, $SE=0.04$, $p< 0.001$), indicating partial mediation.

Conclusion: Emotional exhaustion adversely affects psychological well-being among rescue workers, while psychological capital serves as a protective mediator. Interventions aimed at strengthening psychological capital may help mitigate burnout-related psychological distress in emergency service personnel.

Keywords: Occupational Health (MeSH); Emotional Exhaustion (MeSH); Organizational Psychology (MeSH); Ergonomics (MeSH); Psychological well-being (MeSH); Psychological capital (Non-MeSH); Rescue Workers (MeSH); Mediation Analysis (MeSH); Burnout, Professional (MeSH); Burnout, Psychological (MeSH).

THIS ARTICLE MAY BE CITED AS: Batool I, Quraishi IS, Batool H, Ishaq G. Emotional exhaustion, psychological capital, and psychological well-being among rescue workers: a mediation analysis. Khyber Med Univ J 2025;17(4):394-400.https://doi.org/10.35845/kmuj.2025.23803

INTRODUCTION

Rescue workers, due to the nature of their work, are often exposed to psychological demands. Therefore, work-related psychological health should be considered of the utmost importance as it affects individual and organizational efficiency. International and local evidence shows that emergency and rescue personnel frequently experience high stress, burnout, and reduced psychological well-being, making this population especially vulnerable.[1] According to the job-demand resource (JD-R) model, high job demands cause emotional exhaustion that has an impact on psychological well-being. As a personal resource, psychological capital builds up psychological strength and, in the process, improves psychological health.[2]

Emotional exhaustion (EE) is a condition in which the individual is emotionally drained, experiences diminished personal achievements, and consequently, a lack of energy that may hinder the person from performing effectively at the workplace and in other aspects of life.[3] It is considered to be the first step of the burnout process, and other consequences, such as depersonalization and reduced personal competence, result from it. Recent research continues to highlight the prevalence of emotional exhaustion in various professional settings, particularly among healthcare workers, where it is associated with increased turnover intentions and decreased quality of life.[4] This condition has been linked to various negative outcomes, including decreased job satisfaction, lower productivity, and impaired psychological well-being.

Employees with higher levels of psychological well-being (PWB) are more encouraged, have better ways of handling stress, and have better physical health, hence contributing to a productive and efficient workplace. Regarding the organizational outcomes, a high level of PWB is positively related to employee performance, while having negative relations with absenteeism and turnover intentions.[5,6] PWB is being enhanced by psychological capital by mitigating the adverse effects of work intensification and unfinished nursing care among emergency nurses.

Psychological capital (PC) refers to an individual's positive psychological state of development and is characterized by four core components: hope, self-efficacy, resilience, and optimism. Collectively, these dimensions form a higher-order construct that is associated with improved work performance, greater job satisfaction, and enhanced psychological health in organizational settings.[7] Empirical evidence supports the protective role of psychological capital in stressful work

environments. For instance, Liu Y, et al., demonstrated that higher levels of psychological capital enhance resilience, thereby improving mental health outcomes and attenuating the negative effects of job demands on well-being.[8] These findings are consistent with the Conservation of Resources (COR) theory, which posits that psychological resources such as PC enable individuals to cope more effectively with stressors and safeguard their psychological well-being.[9]

Despite the growing body of literature applying the Job Demands–Resources (JD-R) model, important gaps remain in understanding the dynamic interplay between emotional exhaustion, psychological capital, and psychological well-being, particularly in high-risk occupational groups. Research examining these relationships among rescue workers in Pakistan is notably scarce. Given the unique and intense operational stressors faced by this workforce, investigating these associations is essential for identifying psychological vulnerabilities and informing targeted interventions aimed at promoting mental health and occupational resilience.

Accordingly, the present study seeks to examine the impact of emotional exhaustion on psychological well-being and to evaluate the mediating role of psychological capital in this relationship among rescue workers. The proposed mediation model is theoretically grounded in the JD-R framework, which explains how excessive job demands contribute to emotional exhaustion, while personal resources such as psychological capital foster well-being.[2] Furthermore, COR theory provides additional theoretical support for the mediating role of psychological capital, suggesting that the availability of psychological resources can buffer the adverse effects of resource depletion, such as emotional exhaustion, on psychological well-being.[9]

Hypothesis

H1: Emotional exhaustion will be negatively associated with psychological capital and psychological well-being.

H2: Psychological capital will be positively associated with psychological well-being.

H3: Psychological capital will mediate the relationship between emotional exhaustion and psychological well-being.

METHODS

The study employed correlational research design and was conducted between May 2023 and August 2023 among rescue service providers in South Punjab. The study population included medical officers, computer operators, fire and disaster rescuers, managers and administrators, cycle and ambulance service personnel, and water rescuers. Ethical standards were strictly observed, and formal approval was obtained from the Institutional Review Board of the Department of Applied Psychology, Bahauddin Zakariya University, Multan, Pakistan (Letter No. PSY:738/2023).

Purposive convenience sampling was adopted due to administrative constraints associated with accessing rescue units and the inclusion of operational staff actively deployed on duty. Rescue services in the selected study area are predominantly staffed by males; therefore, the high proportion (95%) of male participants is understandable. However, this imbalance highlights a broader concern regarding gender inequality and workforce disparity within Pakistan's emergency services.

Although there has been a gradual increase in the recruitment of women as Medical Emergency Technicians within Rescue 1122, [10] substantial gaps persist between male and female representation across various emergency service roles. This underrepresentation of women mirrors gender disparities observed in other segments of Pakistan's healthcare system, particularly at primary care, senior academic, administrative, and managerial levels. [11]

The sampling frame comprised approximately 300 rescue workers, of whom 225 completed and returned the survey, yielding a response rate of 75%. In accordance with the American Association for Public Opinion Research (AAPOR) standard response rate formula, defined as the number of completed surveys divided by the total number of individuals contacted, multiplied by 100, the response rate for this study was 75%.[12] A response rate of 70% or higher is generally considered acceptable for generalizability in medical survey research.[13]

After applying the exclusion criteria, a final sample of 206 participants was retained for analysis. The inclusion criteria required participants to be (a) active-duty rescue workers, (b) engaged in operational field roles, and (c) aged between 20 and 40 years. Exclusion criteria included (a) non-operational staff, (b) employees on leave during the data collection period, and (c) respondents who submitted incomplete questionnaires. As non-probability sampling was restricted to a single geographic area, the sample may not fully represent the national population of rescue workers in Pakistan; therefore, the findings should be generalized with caution.

A priori power estimation, based on the recommendations of Fritz and MacKinnon, indicated that a sample size ranging from 148 to 180 participants would be sufficient to detect small-to-moderate mediation effects with 80% statistical power using bootstrapped confidence intervals.[14] This recommended threshold was exceeded, as the final sample comprised 206 participants, thereby ensuring adequate statistical power for the analyses.

Strict ethical standards were observed throughout the study. Ethical approval was obtained from the Institutional Review Board of the Department of Applied Psychology, Bahauddin Zakariya University, Multan, Pakistan (Approval No. PSY:738/2023). Written informed consent was obtained from all participants prior to data collection. The self-administered questionnaires were completed by participants in approximately 15-20 minutes.

Hope, self-efficacy, resilience, and optimism were assessed using the 12-item Psychological Capital Questionnaire (PCQ-12).[15] Participants rated their agreement with each item on a 6-point Likert scale ranging from 1 (strongly disagree) to 6 (strongly agree). Previous studies have demonstrated good internal consistency for this instrument (Cronbach's α=0.78-0.89).

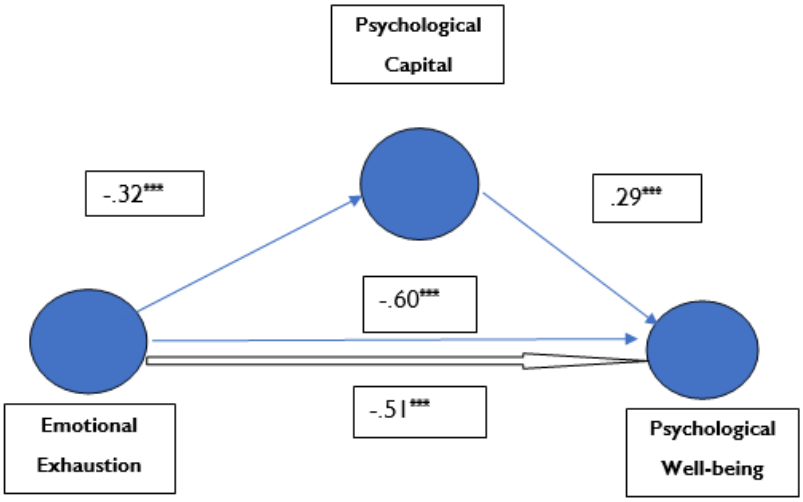

Figure 1: Mediation Model of Psychological Capital (M) on the association between Emotional Exhaustion (X) and Psychological Well-being (Y).

In the present study, the PCQ-12 demonstrated acceptable reliability, with a Cronbach's alpha of 0.75.

Emotional exhaustion was measured using the nine-item emotional exhaustion subscale of the Maslach Burnout Inventory (MBI-EE).[16] Responses were recorded on a 6-point frequency scale ranging from 1 (never) to 6 (every day). Prior research has reported excellent reliability for the MBI-EE (Cronbach's α=0.84-0.90); however, in the current study, the internal consistency was comparatively lower (α=0.61).

Subjective psychological well-being was assessed using the World Health Organization-5 Well-Being Index (WHO-5).[17] This instrument comprises five positively worded items rated on a 6-point scale from 0 to 5. In the present sample, the WHO-5 demonstrated relatively low internal consistency (α=0.57). Nevertheless, the scale was retained because it is one of the most extensively validated and culturally adaptable measures of psychological well-being, with robust psychometric properties reported across diverse populations (Cronbach's α≈0.82). The WHO-5 is recommended by the World Health Organization for brief mental health screening, has been translated into more than 30 languages, and is widely used in both clinical and non-clinical settings. Given its brevity, strong global validation, and suitability for field research involving emergency and rescue personnel, its use in this study is well justified.

Data were analyzed using SPSS version 27.0. Descriptive statistics were computed to obtain means, standard deviations, and frequencies, while Pearson's correlation coefficients (r) were calculated to examine bivariate associations. Mediation analyses were conducted using the PROCESS macro developed by Hayes (Model 4), testing the indirect effects of emotional exhaustion on psychological well-being through psychological capital. Bootstrapping with 5,000 resamples was employed to generate bias-corrected confidence intervals. Statistical significance was set at $p \leq 0.05$.

RESULTS

A total of 225 complete responses were received. Following item non-response assessment and outlier analyses conducted as part of data preparation for the planned statistical analyses, 206 responses were retained after data cleaning. The demographic characteristics of the final sample are summarized in Table I.

The largest number of study participants were emergency medical technicians (29%), followed by lead fire rescuers (21%) and disaster rescuers (19%). Given the nature of the occupations, skewness was observed in gender representation such that 95% of the respondents were male. The mean age of participants was 27.26 (SD= 4.77) with a range of 21 to 40.

Descriptive statistics, including internal consistency reliabilities, skewness, and kurtosis, were computed, along with intercorrelations among the study variables, and are presented in Table II. The skewness and kurtosis values indicated approximate normality of the data.[18] All measurement scales demonstrated acceptable internal consistency.

The psychological capital (PC) total scale and the subscales of Hope (α= .71), Efficacy (α=.74), Resilience (α =.70), and Optimism (α=.72) all demonstrated adequate psychometric reliability. For Emotional Exhaustion (EE) and Psychological Well-Being (PWB), reliability scores were .61 and .57, respectively, as suggested by Kline.[19]

The relationship among emotional exhaustion, psychological capital, and psychological well-being was analyzed through Pearson Product-Moment correlation. All scales are significantly correlated with each other, indicating a strong interrelationship. PC shows significant positive correlations with PWB ($r=.43$, $p<.01$), and a significant negative correlation with EE ($r= -.38$, $p<.01$). PWB is negatively correlated with EE ($r=-.60$, $p<.01$).Given significant relationships among variables, the mediating role of psychological capital was further analyzed using the PROCESS macro (Model 4) in SPSS version 27.0. Table III shows the direct and indirect effects. The total effect of emotional exhaustion on psychological well-being was $\beta= -0.60$, SE =0.06, $t= -10.00$, $p < .001$, $R^2 =.36$. Moreover, emotional exhaustion significantly predicted psychological capital ($\beta = -0.32$, SE=0.05, $t = -5.89$, $p <.001$, $R^2=.14$), and psychological capital significantly predicted psychological well-being ($\beta=0.29$, SE = 0.06, $t=4.18$, $p<.001$, $R^2=.19$). Findings revealed that psychological capital partially mediates the relationship between emotional exhaustion and psychological well-being. After controlling for psychological capital, the direct effect of emotional exhaustion on psychological well-being was reduced ($\beta=-0.51$, SE= 0.05, $t=-8.77$, $p< .001$), but remained

Table I: Sociodemographic characteristics of rescue workers (n=206)

Variable		Frequency (n=206)	Percentage
Setting	Emergency medical technician	60	29
	Lead fire rescuer	43	21
	Disaster rescuer	38	19
	Shifting in charge	22	11
	Station coordinator	19	9
	Rescue driver	17	8
	Maintenance technician	7	3
Gender	Male	199	95
	Female	7	5
Age in years	21-30	164	79
	31-40	42	21

Table II: Descriptive statistics, reliability, and correlations (n=206)

Variable	Items	Mean	SD	Skewness	Kurtosis	A	1	2	3
Emotional Exhaustion	9	2.01	0.91	0.62	0.48	0.61	-	-	-
Psychological Capital	12	3.37	0.77	-0.42	0.10	0.75	-.38***	-	-
Psychological Well-Being	5	3.25	0.93	-0.23	-0.18	0.57	-.60***	-.60***	-

Note: p < .001. Acceptable α range: 0.60–0.802. CI for correlations: 95%.

Table III: Mediation analysis of psychological capital between emotional exhaustion and psychological well-being

Effect	Path	β	SE	t	p	95% CI (LL–UL)
Direct effect (without mediator)	EE → PWB	-0.60	0.06	-9.71	<.001	-0.71 to -0.47
a path b path Direct effect (controlling PC)	EE → PC	-0.32	0.05	-5.89	<.001	-0.43 to -0.21
	PC →PWB	0.29	0.06	4.18	<.001	0.15 to 0.42
	EE →PWB	-0.51	0.05	-8.77	<.001	-0.63 to -0.40
Indirect effect	EE →PC→ PWB	-0.09	0.04	-	<.001	-0.20 to -0.02
Model Summary	R^2=0.45	-				

Note: p<0.05*, p<0.01**, p<0.001***, EE= emotional exhaustion, PWB= Psychological Well-Being, PC= psychological capital. Total effect R^2 = .36, EE → PC R^2= .14, PC → PWB R^2 = .19

significant. The effect size for the mediation was small to moderate (f^2= 0.18) according to Cohen's criteria.[20] Assumptions of PROCESS (linearity, homoscedasticity, and independence of residuals) were checked and met.

DISCUSSION

The findings of the present study provide important insights into the mediational relationship among emotional exhaustion, psychological capital, and psychological well-being among rescue service workers. Consistent with the study hypotheses, emotional exhaustion demonstrated a significant negative association with psychological well-being, suggesting that higher levels of emotional exhaustion are linked to poorer mental well-being. These results align with a substantial body of existing literature documenting the detrimental effects of emotional exhaustion and burnout on mental health outcomes, including heightened risks of anxiety, depression, and diminished quality of life.[1, 21] The persistence of this association across diverse occupational groups highlights emotional exhaustion as a critical risk factor for impaired psychological functioning. Recognizing this relationship is essential for informing targeted interventions and organizational strategies aimed at preserving psychological well-being in high-stress professional settings.

Furthermore, it was hypothesized that emotional exhaustion would be negatively associated with psychological capital. The findings support this hypothesis, indicating that individuals experiencing higher levels of emotional exhaustion tend to report lower levels of psychological capital. This observation is consistent with existing literature, which suggests that burnout-particularly its emotional exhaustion component-erodes psychological capital by diminishing an individual's capacity to cope effectively with sustained job demands.[22]

This relationship can be interpreted through the lens of the Conservation of Resources (COR) theory and the Job Demands–Resources (JD-R) model, both of which posit that prolonged exposure to workplace stressors results in the gradual depletion of personal and psychological resources.[2,9] In this context, psychological capital functions as a protective resource, such that individuals with higher levels of hope, self-efficacy, resilience, and optimism are less susceptible to burnout and its associated symptoms.

Psychological capital demonstrated a significant positive association with psychological well-being, providing

empirical support for the hypothesis that individuals with higher levels of psychological capital experience better overall well-being. This finding is consistent with the broaden-and-build theory, which posits that positive psychological states foster the development and strengthening of personal resources, thereby enhancing long-term well-being.[23] In high-demand occupational contexts, such as healthcare and emergency services, psychological capital has been shown to buffer the adverse effects of job-related stressors and promote favorable mental health outcomes.[24]

Furthermore, mediation analysis revealed that psychological capital partially mediates the relationship between emotional exhaustion and psychological well-being. The significant indirect pathway indicates that emotional exhaustion not only exerts a direct detrimental effect on well-being but also indirectly undermines well-being through the depletion of psychological capital. This dual pathway highlights the pivotal role of psychological capital as a modifiable psychological resource. Consistent with prior research, these findings suggest that organizational and clinical interventions aimed at enhancing psychological capital, such as resilience-building initiatives, optimism training, structured stress-management programs, and supportive leadership practices, may effectively mitigate the negative psychological consequences of emotional exhaustion among rescue workers.[25]

Limitations of the study

Despite these strengths, several limitations should be acknowledged. First, the internal consistency for some scales, especially psychological well-being ($\alpha = .57$) and emotional exhaustion ($\alpha = .61$) was lower than ideal, which may have influenced the precision of the estimates. Second, the use of purposive convenience sampling from one region and the male-dominated nature of the occupation (95% male) may have introduced selection bias and limited generalizability. More gender balanced samples from rescue workers would also add to the gaps in knowledge and speculation regarding psychological resilience and wellbeing in this high-risk occupation, as well as the differences of these variables by gender. Third, unmeasured confounders such as job tenure, shift hours, exposure to traumatic incidents, sleep quality, and social support may also influence psychological well-being but were not assessed. Fourth, the cross-sectional design limits causal inference. Future studies should use probability sampling, include more diverse rescue settings, measure additional confounding variables, and employ longitudinal or experimental designs to better establish causal pathways.

RECOMMENDATIONS

These findings emphasize the importance of addressing emotional exhaustion as a modifiable occupational risk factor, alongside strengthening psychological capital, to enhance psychological well-being among rescue workers. Accordingly, organizational strategies aimed at managing workload, such as regulating performance demands, prioritizing employee welfare, and implementing stress-prevention measures, are essential to reducing emotional exhaustion. In parallel, the development of targeted interventions designed to enhance psychological capital, including resilience-building programs and positive psychology–based interventions, may help buffer the adverse effects of EE on well-being.[25]

Additionally, organizations may consider implementing peer-support initiatives, ensuring structured access to counseling services, optimizing duty-hour schedules, and instituting formal stress-debriefing protocols. Prior evidence indicates that such organizational and psychosocial interventions play a protective role in preserving mental health and psychological well-being in high-risk professional settings.

CONCLUSION

This study demonstrates that emotional exhaustion has a significant adverse effect on psychological well-being, both directly and indirectly through the depletion of psychological capital. While emotional exhaustion undermines well-being, psychological capital partially mediates this relationship, indicating that individuals with higher levels of psychological capital are better positioned to sustain psychological well-being despite ongoing occupational stressors. These findings support the importance of strengthening psychological resources among rescue workers as a core component of workplace mental health initiatives. Future research should adopt longitudinal designs, recruit more diverse and representative samples, and evaluate targeted interventions aimed at reducing emotional exhaustion and enhancing psychological capital to better inform evidence-based policy and practice.

ACKNOWLEDGEMENTS

The Author would like to thank Mudassir Shahzad, an Emergency Medical Technician at Rescue 1122, Multan, for his valuable assistance in the data collection process for this study.

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AUTHORS' CONTRIBUTION

The Following authors have made substantial contributions to the manuscript as under:

IB & ISQ: Conception and study design, acquisition of data, drafting the manuscript, approval of the final version to be published

HB & GI: Analysis and interpretation of data, critical review, approval of the final version to be published

Authors agree to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.

CONFLICT OF INTEREST

Authors declared no conflict of interest, whether financial or otherwise, that could influence the integrity, objectivity, or validity of their research work.

GRANT SUPPORT AND FINANCIAL DISCLOSURE

Authors declared no specific grant for this research from any funding agency in the public, commercial or non-profit sectors

DATA SHARING STATEMENT

The data that support the findings of this study are available from the corresponding author upon reasonable request

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