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Title: Examining the Relationship Between Resilience, Spiritual Health and Quality of Life Among Emergency Nurses in In-Hospital and Pre-hospital Settings

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Abstract:

Background: Emergency service workers experience extreme psychological stress as they are the first to respond to accidents and disasters, and this can deplete their quality of life. Resilience has a very significant part in enabling individuals to cope with stress effectively without detracting from physical and psychological well-being. The objective of this study was to evaluate the status of resilience and establish its correlation with quality of life and spiritual well-being between nurses working in In-hospital and pre-hospital emergency departments.

Materials and Methods: This cross-sectional study was carried out in 2024 across four hospitals affiliated with Mashhad University of Medical Sciences. A total of 212 emergency nurses were recruited using a cluster sampling approach. Each hospital was considered a cluster; four hospitals were randomly chosen, and data were collected from these hospitals through convenience sampling with proportional allocation based on job categories. Data collection instruments were a demographic questionnaire and three standardized questionnaires: Paloutzian and Ellison's Spiritual Health Questionnaire (20–120), the Connor-Davidson Resilience Scale (0–100), and the WHO Quality of Life Questionnaire (0–100). Data were analyzed with descriptive and inferential statistics (Mann-Whitney, t-test, Chi-square, Fisher's exact, Spearman correlation) in SPSS version 26.

Results: The response rate was 70%. The spiritual health of participants was moderate (mean = 72.28 ± 15.85) as indicated by 96.7% of them. Mean scores of 83.89 ± 17.01 for quality of life and 58.72 ± 15.72 for resilience indicated moderate levels among the participants. Religious health scored higher than existential health. Environmental health had the highest mean among the quality-of-life facets; personal competence had the highest in resilience. There were positive correlations between quality of life, resilience, and spiritual health ($P < 0.001$). Spiritual health and resilience had direct effects on individuals' quality of life.

Conclusion: Emergency nurses showed moderate levels of resilience, spiritual health, and quality of life, and these variables were positively correlated. Interventions that enhance spiritual health and promote resilience can be effective in their quality of life improvement.

Keywords: Resilience, Spiritual Health, Quality of Life, Emergency Services, Emergency Nurses, Pre-hospital Emergency Care

Introduction:

Globally, the number and impact of disasters have risen in recent years, resulting in notable economic and social challenges (1). Iran, identified as a highly disaster-prone country, has likewise suffered significant fatalities and injuries from natural and man-made disasters (2). The emergency services—both pre-hospital and hospital-based—are key components in responding to disasters and addressing the needs of affected individuals. Providing high-quality emergency care depends heavily on a skilled and motivated workforce (3). However, recruiting and retaining such personnel is challenging due to the demanding nature of emergency and security-related professions.

Evidence from multiple studies, including a systematic review on the impact of emergency medical service work on personnel's physical, mental, and social well-being, indicates that this type of work heightens the likelihood of health disorders such as post-traumatic stress disorder, depression, and anxiety(4). A study conducted among emergency nurses in China revealed that job stress and burnout levels were higher than average in this group (5). Other studies indicated that exposure to stress-related conditions can lead to burnout and job turnover, significantly impacting quality of life. Quality of life refers to an individual's perception of their overall life status, influenced by their cultural context, personal values, expectation and social surroundings (6, 7).

Resilience plays a critical role in enabling individuals to effectively navigate and adapt to crisis situations. It reflects the ability to maintain mental and emotional stability under difficult circumstances (8, 9). Losino's study involving 1,422 frontline healthcare workers in Spain who treated COVID-19 patients showed that resilience served in mitigating the risk against several psychological difficulties. Employees with higher resilience levels were less likely to experience mental health issues (10). Another study conducted in the United States on emergency medical service (EMS) workers found that more resilient individuals were less likely to develop PTSD (11).

The literature in this area, primarily focused on the psychological or physical dimensions of resilience, with limited attention to its connection with spiritual health, an equally important yet often overlooked dimension of well-being. However, Spiritual well-being can be described as a sense of harmony derived from one's relationship with self, others and a transcendent force, as well as from adherence to personal core values (12). Investigations have demonstrated that spiritual health correlates with different components of health (13, 14). Spiritual health plays a significant

role in maintaining or restoring biological-psychological balance after a disaster or crisis. In Iran, where spirituality is deeply embedded in both cultural and professional identity, exploring how resilience relates to spiritual health among nurses offers important context-specific understanding. Moreover, resilience is one of the key factors that can significantly affect quality of life (15).

Nurses provide direct support, emotional comfort, and education to patients and spend much time at the patient's bedside, allowing them to be the first to notice subtle changes in a patient's condition. Their strong communication and critical thinking skills enable them to play a crucial role in ensuring patient safety and well-being. Accordingly, promoting resilience, enhancing nurses' quality of life, and fostering spiritual health are crucial. The aim of this study was to assess the levels of resilience, quality of life, and spiritual health among in-hospital and pre-hospital emergency nurses and to explore the relationships among these constructs.

Materials and Methods:

Study Design and Setting:

This cross-sectional study was carried out in 2024 among nurses employed in emergency departments and pre-hospital emergency services (EMS 115) at Mashhad University of Medical Sciences

Sample Size and Sampling Method:

Cluster sampling was employed in this study. Each hospital was considered a cluster; four hospitals were randomly selected, and data were collected from these hospitals using convenience sampling with proportional allocation based on job categories. Participants were included if they had at least one year of experience in the emergency departments of the selected hospitals or in EMS 115. Those who left more than 30% of the questionnaire items unanswered were excluded.

The sample size was determined using a formula that assumed a 0.05 type I error, 80% statistical power, and a very weak correlation coefficient ($r = 0.02$), due to the lack of comparable studies.

$$n = \frac{2(z_{1-\alpha/2})^2}{\ln \frac{1+r}{1-r}}$$

Considering a potential 20% attrition rate due to incomplete questionnaires, the final estimated sample size was approximately 300 participants.

Data Collection Tools:

Four questionnaires were used for data collection:

1. Demographic Questionnaire:

The questionnaire gathered data on participants' gender, age, employment type, marital status, work experience, and monthly shift count.

2. Spiritual Health Questionnaire:

Participants' spiritual health was assessed using the Paloutzian and Ellison Spiritual Health Scale (16), which has been widely used in previous studies for healthcare workers, including nurses (17, 18). The validity and reliability of this 20-item questionnaire were supported by studies like Seyed Fatemi et al. in Iran, reporting a reliability coefficient of 0.82 (16). It assesses two dimensions: existential health (10 items) and religious health (10 items). The scale consists of items rated on a six-point Likert continuum, from "strongly disagree" to "strongly agree." For scoring purposes, positively phrased statements receive scores from 1 to 6, while negatively phrased items are reverse-scored. Scores on the scale vary from 20 to 120, with higher totals indicating stronger spiritual well-being. Based on the total score, spiritual health is grouped into low (20–40), moderate (41–99) and high (100–120) categories.

Connor-Davidson Resilience Scale (CD-RISC):

Resilience was assessed using the 25-item Connor-Davidson Resilience Scale (19). Samani et al. validated this scale in the Iranian context, reporting a Cronbach's alpha of 0.87, confirming its reliability and validity. The scale employs a five-point Likert response format ranging from 0 ('not true at all') to 4 ('true nearly all the time'), yielding total scores between 0 and 100, with higher scores indicating greater resilience. It measures five dimensions: personal competence (8 items), trust in one's instincts and tolerance for

negative emotions (7 items), acceptance of change and secure relationships (5 items), control (3 items), and spiritual influences (2 items).

3. WHOQOL-BREF Quality of Life Questionnaire:

The WHOQOL-BREF, a 26-item questionnaire, was used to assess quality of life (20). Its Persian translation was validated by Nejat et al (21). The tool evaluates four domains, psychological, physical, environmental health, and social relationships, using a five-point scale, with total scores converted to a 0–100 scale, where higher scores represent better quality of life.

Data Analysis:

The data were examined through a combination of descriptive and inferential statistical methods, with descriptive statistics covering standard deviations, frequencies, and means. Inferential statistics employed Mann-Whitney, t-test, Kolmogorov-Smirnov, chi-square, Fisher's exact test, and Spearman's correlation coefficient. Data were analyzed using SPSS version 26, with a significance threshold set at 0.05 for all tests. Here, missing values were replaced with the mean of the recorded values.

Ethical Considerations:

The study received approval from the Research Deputy of Mashhad University of Medical Sciences (Proposal Code: 4020841) and the Ethics Committee (Ethics Code: IR.MUMS.IRH.REC.1402.155). Ethical considerations were upheld throughout every phase of the research process. All participants provided informed consent before being enrolled in the study.

Results:

A group of 212 individuals were involved in the research, yielding a 70% response rate. Participants' demographic details are shown in Table 1, which indicates that their mean age was within the middle-aged category. The majority of respondents were male, and marital status data indicated that a high percentage were married. In terms of employment status, approximately half of the participants were on permanent employment.

Table 1: Characteristics of the Study Sample (n = 212)

Variable		Mean ± Standard Deviation
Age		34.95±7.83
Work Experience (in years)		10.17±6.93
Number of work shifts per month		29.49±11.46
		Number (Percentage)
Gender	Male	144 (%68)
	Female	68 (%32)
Marital Status	Single	52 (%24.5)
	Married	160 (%75.5)
Employment Status	Permanent work	99 (%46.7)
	Temporary work	113 (%53.3)
Job	Nurse in Hospital	114 (%53.8)
	Nurse in EMS	98 (%46.2)

The findings showed that the majority of participants exhibited a moderate level of spiritual health, with an overall mean score of 72.28 out of 100, and the religious health dimension scored higher than existential health. Furthermore, the overall mean score of quality of life (83.89 out of 100) reflected a relatively favorable level of quality of life among the participants. Among its dimensions, environmental health had the highest mean score, while social relationships showed the lowest mean compared to other dimensions. In addition, the overall mean score of resilience (58.72 out of 100) indicated a moderate level of resilience in this group. Among the dimensions of

resilience, personal competence had the highest mean score, whereas spiritual influences had the lowest (Table 2).

Table 2: Assessment of Quality of Life, Spiritual Health, and Resilience in the Study Sample

Variable	Dimensions	Mean \pm Standard Deviation
Spiritual Health	existential health	33.95 \pm 8.79
	religious health	38.33 \pm 8.40
	Total	72.28\pm15.85
Quality of life	physical health	23.83 \pm 4.93
	psychological health	19.20 \pm 4.50
	social relationships	9.92 \pm 2.60
	environmental health	23.96 \pm 5.59
	Total	83.89\pm17.01
Resilience	personal competence	18.69 \pm 5.94
	trust in one's instincts and tolerance of negative emotions	15.46 \pm 4.25
	acceptance of change and secure relationships	12.44 \pm 3.48
	control	6.78 \pm 2.57
	spiritual influences	5.35 \pm 2.03
	Total	58.72\pm15.72

The results indicated that male participants had significantly higher resilience scores than females ($P < 0.05$). A notable variation in spiritual health was also found among married and single participants ($P < 0.05$), with married individuals reporting higher levels. Although permanent employees showed higher mean scores for spiritual health, quality of life, and resilience than other groups, these differences were not statistically significant. In terms of job setting, EMS nurses demonstrated higher scores for spiritual health, quality of life, and resilience compared to hospital nurses; however, only the difference in spiritual health reached statistical significance. Furthermore, age was positively and significantly correlated with both spiritual health and resilience but showed no significant association with quality of life. Likewise, years of work

experience were positively and significantly correlated with spiritual health, quality of life, and resilience (Supplementary 1).

The statistical analysis revealed significant positive correlations among spiritual health, resilience, and quality of life. A strong and statistically significant association was found between spiritual health and quality of life ($r = 0.65$), as well as between spiritual health and resilience ($r = 0.7$). Moreover, a moderate yet significant positive showed a relationship with quality of life and resilience ($r = 0.5$). All correlations were significant at $p < 0.001$ (Table 3).

Table 3: Relationship Between Resilience, Spiritual Health, and Quality of Life.

Variable	Spiritual Health		Quality of Life		Resilience	
	p-value	Statistics	p-value	Statistics	p-value	Statistics
Spiritual Health	<0.001 ^Φ	1 ^{cc}	<0.001 ^Φ	0.65 ^{cc}	<0.001 ^Φ	0.70 ^{cc}
Quality of Life	<0.001 ^Φ	0.65 ^{cc}	<0.001 ^Φ	1 ^{cc}	<0.001 ^Φ	0.50 ^{cc}
Resilience	<0.001 ^Φ	0.70 ^{cc}	<0.001 ^Φ	0.50 ^{cc}	<0.001 ^Φ	1 ^{cc}

^Φ Spearman test, ^{cc} Correlation Coefficient

Discussion:

This study assessed spiritual quality of life, health, resilience and among emergency staff in both in-hospital and pre-hospital settings. The following section presents and discusses the findings.

Resilience

The average resilience score of the participants was 58.72 out of 100, indicating a moderate resilience level. This result corresponds with Amini's research (22), which reported a mean resilience score of 52.62 among nurses. Similarly, Jafari et al. (23) found a mean resilience score of 68.45 out of 100 among nurses in Tehran, indicating moderate resilience levels.

In our study, male participants exhibited significantly higher resilience scores compared to females ($P < 0.05$). This finding aligns with the study by Sedighi and Bidgoli (24), which examined gender differences in resilience levels among students at Kashan University, Kashan, Iran. Conversely, Ansari et al. (25) found no significant gender-based differences in resilience among nurses in Kerman. Such discrepancies may be attributable to factors such as environmental conditions, cultural characteristics, occupational differences, or other intervening variables. Furthermore, resilience was positively correlated with age and work experience. Although this contrasts with Timalsina and Sung Wathana's study (8) which reported an inverse relationship. This discrepancy could stem from the different age group in the two studies. In the current study, the majority of participants were middle-aged, whereas Timalsina's research centered on factors promoting resilience among older adults in disaster contexts.

Quality of Life

The quality-of-life score averaged 83.89 out of 100, suggesting a relatively favorable status among participants. This aligns with Ossarroudi et al. (26), who found a mean score of 64.38 among nurses. Additionally, Yazdimoghaddam et al. (27) found that 64% of nurses experienced moderate quality of life.

Across the quality-of-life subdomains, environmental health scored highest, while social relationships scored lowest. In contrast, Fernandes et al. (28), reported lower environmental scores and higher scores in psychological and social domains among ICU nurses. These differences could be due to variations in professional contexts, demographic factors, and institutional resources. Such variations underscore the need for further investigation and the tailoring of quality-of-life improvement programs to the specific contexts of each population.

Regarding demographic factors, our analysis revealed a strong correlation between work experience and quality of life, indicating that nurses with longer work experience reported better quality of work life. This supports findings by Moradi et al. (29), who also observed a positive relationship between professional tenure and quality of work life. Likely, more experienced staff encounter lower stress and greater job stability, which enhances their overall work life quality (30).

Spiritual Health

The majority of participants (96.7%) reported moderate levels of spiritual health, a finding consistent with the results of Gholipour Khanmiri et al. (17) and Moeini et al. (31), who observed similar patterns among nurses in Tabriz and cardiac ICUs. In this study, EMS nurses demonstrated higher spiritual health compared to hospital-based nurses, which may be attributed to the distinctive nature of pre-hospital work, where staff frequently encounter sudden life-threatening situations, direct exposure to death, and acute emotional events. Such experiences may promote the adoption of spiritual coping strategies as a means of finding meaning and maintaining emotional stability. Previous research similarly indicates that EMS and pre-hospital personnel often rely more on spirituality to manage the stress and emotional demands of frontline emergency work (32, 33).

Additionally, a notable variation in spiritual health scores was observed between married and single participants, with married individuals exhibiting higher levels. This aligns with the findings of Shamsaei et al. (34), who reported higher spiritual health among married medical students, and Ezati et al. (35), who also identified a significant association between marital status and spiritual health. Prior studies suggest that strong family connections play a crucial role in fostering religious practices and beliefs, as positive family relationships enhance participation in spiritual activities and reinforce the faith of family members (36).

This study showed that age and years of professional experience had significant positive correlations with spiritual health. Given their overlap, Sadeghian et al. (37) also found a direct relationship between work experience and spiritual health among nurses in Hamadan. Taghizadegan Zadeh et al. (38) also reported that spiritual health tends to improve with age among nurses, faculty, and students. Other studies attribute this relationship to a natural inclination toward spirituality with aging, as individuals face the realities of death and meaning of life (39). This trend may also result from improved coping skills, intellectual maturity, and strengthened spiritual beliefs over time.

The relationships of resilience, quality of life and spiritual health

The findings of study indicated a significant positive association between spiritual health and quality of life. This finding aligns with the work of Ossarroudi et al. (27), who observed that higher

levels of spiritual health were associated with improved quality of life among nurses. Similarly, studies by Finkelstein et al. (40), Hsiao et al., and Mitchell (41, 42) also reported a direct link among quality of life and spiritual well-being. These findings suggest that spirituality provides individuals with a sense of meaning and connection to a higher power, enabling more effective coping with challenges. Consequently, such a spiritual perspective contributes to greater life satisfaction and overall well-being (43).

Our analysis also showed a significant positive link between spiritual health and resilience, echoing findings by Sadeghian and Abdolvand (44) among healthcare workers in Tehran. Similarly, the study by Cook and White (45) found that spirituality directly influences resilience. Resilience enables individuals to cope better with stress and difficult circumstances. Spiritual health contributes to this by fostering acceptance, adaptability, and strength in facing challenges. Spirituality fosters acceptance, professional ethics, and a positive outlook, ultimately improving resilience and facilitating the easier acceptance of adverse events (44, 46, 47).

correlation was also identified between quality of life and resilience, supporting the findings of Moshtaghian et al. (15), who reported that resilience plays a significant role in enhancing nurses' quality of life. Resilience is a key factor in enhancing quality of life, as it helps individuals develop better coping mechanisms, leading to improved quality of life (48, 49). In addition, life satisfaction as a part of the quality of life can be improved with increased resilience. Resilience shapes a positive outlook on life by altering emotions and feelings, resulting in greater life satisfaction. Additionally, resilience reduces stress, fostering a sense of contentment and ultimately enhancing quality of life (50).

Spiritual health may serve as a mediating factor between resilience and quality of life, as suggested by our correlation analysis. A study by Chen et al., found similar correlation among advanced cancer survivors (51). Their findings indicated that patients with greater resilience tended to report stronger spirituality, which contributed to better quality of life. Literature also supports a strong link between spirituality, resilience, and quality of life across diverse demographics and health conditions (52). This study includes three dimensions of emergency work; resilience, spiritual health and quality of work and provides an overview of the situation of these dimensions. It highlights the importance of considering these three dimensions in emergency hospital and

prehospital settings. Training appears particularly relevant for emergency nurses. Tailored strategies, such as brief on-the-job meaning-centered coaching, peer-support reflective groups with spiritual components, and mindfulness modules adapted to EMS workflows, could enhance both spiritual health and resilience. Previous studies support the effectiveness of such interventions: meaning-centered coaching improved spiritual competence in nurses (53). Mindfulness and resilience programs reduced burnout among EMS staff (32). Spiritually-informed resilience interventions enhanced coping and quality of life in healthcare professionals (54). These findings suggest that culturally-adapted, combined interventions can be implemented to strengthen emergency nurses' well-being, improve their coping capacity, and ultimately support better patient care.

A limitation of this study lies in its cross-sectional design, which, although effective for identifying associations among variables, limits the ability to infer causal relationships. Future research could address this limitation by employing qualitative methods to explore deeper dimensions of the subject. Moreover, we did not study the probable mediation role of resilience or spiritual health in promoting quality of life.

Conclusion:

This study demonstrated that spiritual health, resilience and quality of life were positively correlated among in-hospital and pre-hospital emergency nurses. While some dimensions, such as religious orientation and environmental health, were stronger, others, particularly existential well-being and social connectedness, were weaker. These findings underscore the importance of designing interventions to strengthen both protective and vulnerable aspects of nurses' psychosocial functioning. Future research should include interventional and longitudinal studies to evaluate the effectiveness of resilience training, spiritual care programs, and strategies to enhance social support, as well as extend these investigations to other healthcare professionals and cultural contexts.

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Conflict of Interest:

The authors declare that they have no conflicts of interest related to this study.

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Supplementary material:

Supplementary 1: Associations Between Demographic Factors and Spiritual Health, Quality of Life, and Resilience

Variable		Spiritual Health			Quality of Life			Resilience		
		Mean ± S.D	P- value	Statist ics	Mean ± S.D	P- valu e	Statist ics	Mean ± S.D	P- valu e	Statist ics
Gender	Male	38.52±8.7			62.67±22.			60.10±15		
		7	0.418	-	90	0.83	-	.67	0.04	-
	Female	37.92±7.6	^a		61.21±25.	7 ^a		55.79±15	2 ^a	
		1			03			.54		
Marital Status	Single	65.13±16.			59.61±25.			55.78±14		
		98	<0.00	-	79	0.33	-	.93	0.06	-
	Married	74.60±14.	1 ^a		63.04±23.	1 ^a		59.67±15	1 ^a	
		79			17			.89		
Employ ment Status	Permane nt	73.12±15.			63.01±22.			59.51±15		
		81	0.082	-	80	0.37	-	.97	0.14	-
	Tempora ry	68.51±15.	^a		58.65±27.	1 ^a		55.20±14	7 ^a	
		66			97			.21		
Job	Nurse in	70.42±15.			60.41±25.			57.83±14		
	Hospital	38	0.033	-	70	0.39	-	.36	0.31	-
	Nurse in	74.43±16.	^a		64.28±21.	1 ^a		59.75±17	4 ^a	
	EMS	18			38			.18		

Age		0.006			0.18			0.02	
Work	-	b	0.189 ^c	-	4 ^b	0.092 ^c	-	0 ^b	0.160 ^c
Experience		<0.00			0.01			0.00	
Number of	-	1 ^b	0.236 ^c	-	1 ^b	0.147 ^c	-	6 ^b	0.188 ^c
work		0.110	-			-		0.16	-
	-	b	0.110 ^c	-	0.275 ^b	0.075 ^c	-	8 ^b	0.095 ^c

^{\$}Mann-Whitney U test, ^Φ Spearman test, ^{cc} Correlation Coefficient