

# Relationship Between Low Back Pain With Quality of Life, Depression, Anxiety and Stress Among Emergency Medical Technicians

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**Background:** Musculoskeletal disorders have become increasingly common among healthcare providers. They have become the most common cause of work-related disabilities among nurses.

**Objectives:** The current cross-sectional study aimed to measure the prevalence of back pains among emergency medical technicians (EMTs), and association of back pain with quality of life, depression, anxiety and stress.

**Materials and Methods:** One hundred and eighty registered nurses working as EMTs at the Hamadan Emergency Medical Center were selected by consensus. Data collection tools were Demographic, Perceived Quality-of-Life, Short Form Health Survey (SF-36), and Depression Anxiety Stress Scales (DAS21) and pain scale measurements.

**Results:** Data showed that while 50.7% of the participants had an average awareness of the basic principles of back care, the majority (71.8%) had at least one type of back pain. There were associations between the prevalence of pain and depression ( $P = 0.049$ ), pain and awareness ( $P = 0.035$ ), and stress and job satisfaction ( $P = 0.024$ ).

**Conclusions:** A large number (about two-thirds) of EMTs had some sort of back pain; it is highly recommended to promote the attitude and motivation of the individuals to take care to prevent back injury and inform them of the principles of back care. Implications for primary prevention and care practice include encouraging EMTs to apply accurate principles of back care.

**Keywords:** Emergencies; Emergency Medical Technicians; Back Pain; Depression; Anxiety; Stress Disorders, Traumatic, Acute

## 1. Background

Emergency Medical Service (EMS) is an essential part of the healthcare system. It is also an exclusive profession where personnel are requested to treat and transport the sick and injured (1). The Emergency Medical Technicians (EMTs) encounter several occupational dangers (2-5). Musculoskeletal damages, especially of the back, are common complaints among EMTs (6). Performing tasks that put strain on the back are commonplace in their duty (6-8). In this regard, EMT tasks include moving and transporting patients and performing cardiopulmonary resuscitation (1). There are also other stressors specifically related to clinical practice in various settings (9, 10). Though predictors of back pain have been well recognized in many health professions (11, 12); EMTs are expected to supply medical care in various high-risk locations (13).

EMTs are susceptible to psychological distress in the short and long term as well. While working as an EMT can be fulfilling they are often confronted with several traumatizing conditions. Some of them are rated as being very stressful such as children accidents, death, burns, and violent incidents (14, 15). One study (16) indicated that compared to other health professionals,

levels of burnout and stress among EMTs are very high. Participation in a disaster may put personnel at risk of post-traumatic stress disorder (PTSD). Different studies indicated the prevalence of PTSD in traffic accidents (17), fire fighters, and EMTs (15) as 80%, 18% and around 20% respectively. Psychiatric symptoms can be related to a traumatic incident experienced by EMTs (18). Many studies in the world designate that these conditions are universal and nursing is a very exhausting profession that causes many pathological symptoms. In this regard, Elfering et al. indicated that in Switzerland nurses are at risk of low-back pain (19); Lavanco found that in Sicily, Italy, burnout is more common among nurses than the others (20), and Stordeur et al. reported that emotional fatigue among Belgian nurses was the result of work-related stress (21).

Until now, occupational health within EMTs has moderately received attention. Investigators are aware that EMTs may be at risk of work-related health problems (22-24) and they occasionally have to encounter unpredictable risks such as the possibility of acquiring diseases from patients or being attacked by unstable patients (25).

Since EMTs job is extremely stressful (26), various physical and mental stresses for EMTs have been increas-

ing (27). More studies propose that EMTs have a more stressful work environment than the others (28, 29). We sought to assess the prevalence of back problems among the EMTs.

## 2. Objectives

The current study aimed to determine the prevalence of back pain among the EMTs and its associations with quality of life (QoL), depression, anxiety and stress.

## 3. Materials and Methods

### 3.1. Sampling

The current cross-sectional study was conducted in 10 EMCs in Hamadan province and 180 nurses, holding a bachelor degree, working as EMTs were selected by consensus in 2014.

### 3.2. Instrument

The following data gathering tools were utilized: demographic questionnaire, back pain scale, Perceived Quality-of-Life (PQoL), Short Form Health Survey (SF-36), and Depression Anxiety Stress Scales (DASS-21). To determine the validity and reliability of the questionnaires, content validity and alpha Cronbach's coefficient were used (PQoL,  $\alpha = 0/9$ ), (SF-36,  $\alpha = 0/65$ ), (DASS-21,  $\alpha = 0/91$ ).

### 3.3. Demographic Questionnaire

This questionnaire assessed EMTs characteristics such as age, sex, and marital status, academic education, awareness of principles of back care and adherence to prevention protocols.

### 3.4. Back Pain Scale

This scale consisted of three sections, type (lumbar, neck, thorax, lower back, pelvic), intense (mild, moderate, severe) and duration of pain (per month). The scale was made by the author and validated by five university faculty members.

### 3.5. Perceived Quality of Life

PQoL (Patrick et al., 2000) questionnaire was designed to evaluate quality of life of the EMTs. PQoL was a 20-item tool (19 items, each with an 11-point response scale which has physical, social, and cognitive health satisfaction subscale scores and one item for rating happiness). All items used a 0-10 scale to rate happiness. To measure the validity of questionnaire, content-validity approach was applied.

### 3.6. Short Form Health Survey

Health-related QoL of EMTs was evaluated with the 36-item Short Form Health Survey (SF-36). The SF-36

contains eight subscales including social functioning, physical functioning, and role limitations due to emotional problems, role limitations due to physical health problems, vitality, mental health, general health perceptions, and bodily pain. SF-36 scores vary from 0 to 100; higher scores represented better health related quality of life (HRQoL).

### 3.7. Depression Anxiety Stress Scales

Depression Anxiety Stress Scales (DASS-21) is a 21-item tool proposed to evaluate the three states of depression, anxiety, and stress. DASS-21 cutoff scores suggested by Lovibond (1995), were categorized as extremely severe (DASS score = 28-42), severe (DASS score = 21-27), moderate (DASS score = 13-20), mild (DASS score = 10-12), and normal (DASS score = 0-9).

### 3.8. Analysis

Descriptive-analytic methods were employed to analyze the gathered data. The gathered data were analyzed by SPSS computer software Version 13.0 and through Chi-square, Univariate Analysis of Variance, t-test and Mann Whitney u tests. P value less than 0.05 considered statistically significant.

### 3.9. Ethics

Before starting the study all participants were familiarized with the study goals. Also before completion of the questionnaire they signed the written consent forms.

## 4. Results

From 180 subjects, 75 EMTs personnel filled out the questionnaires; all were male, 97.2% had a bachelor of science (BS) degree and 2.8% had a master of science (MSc) degree, the rest of the subjects were all registered nurses (RN), 69% single, and 30% married (Table 1). Furthermore, 71.8% of the subjects had at least one type of pain, most commonly low back pain and 32.4% had mid-back pain.

The study showed that while 50.7% of the participants had average awareness of accurate principles of back care, only 15.5% always applied them at work. There was a positive significant correlation between the prevalence of back pain and awareness of basic principles of back care ( $P = 0.006$ ) and applying the principles of back care ( $P = 0.03$ ) (Table 2).

Also Mann Whitney u test showed a statistically significant difference in the level of depression with respect to existence of pain and non-existence of pain among the participants ( $P = 0.049$ ).

Univariate Analysis of Variance showed a significant relationship between PQoL and smoking ( $P = 0.029$ ). There was also significant relationship between physical function and smoking ( $P = 0.028$ ), pain and awareness ( $P = 0.035$ ), general health and exercise ( $P = 0.045$ ), physical component and smoking ( $P = 0.017$ ), social function and

**Table 1.** Demographic Features of the Participants

Variable	Percentage, %
<b>Marital Status</b>	
Married	29.6
Single	69
Divorced	1.4
<b>Smoking</b>	
Never	81.7
Cessation	8.5
Smoker	9.9
<b>Age</b>	
20-39 Years	12
40-59 Years	15
60 Years	9
<b>Awareness application</b>	
Never	11.3
Very low	8.5
Low	23.9
Moderate	40.8
Always	15.5
<b>Job satisfaction</b>	
No	4.8
Yes	95.2
<b>Education</b>	
Postgraduate	2.8
Bachelor	70.4
Upper Diploma	26.8
<b>Boss attention to EMTs health<sup>a</sup></b>	
No	90.1
Yes	8.5
<b>Experience</b>	
> 2 Years	25
2-5 Years	30
< 5 Years	45
<b>Awareness of back care principals</b>	
None	5.6
Very low	11.3
Low	9.9
Moderate	50.7
High	22.5
<b>Standard tool</b>	
No	60.6
Yes	39.4
<b>Exercise</b>	
No	78.9
Yes	21.1

<sup>a</sup> Abbreviation: EMT, emergency medical technicians.**Table 2.** Relationship Between Back Pain and Awareness of Accurate Principles of Back Care and Application

Variable	Back pain		P Value
	NO	Yes	
<b>Awareness of back care principals</b>			0.006
None	0	4	
Very low	7	1	
Low	5	2	
Moderate	29	6	
High	10	6	
<b>Application</b>			0.03
Never	3	5	
Very low	6	0	
Low	13	4	
Moderate	23	5	
Always	6	5	

smoking ( $P = 0.045$ ), social function and job satisfaction ( $P = 0.044$ ), mental component and smoking ( $P = 0.045$ ), stress and job satisfaction ( $P = 0.024$ ), anxiety and smoking ( $P = 0.033$ ), depression and smoking, awareness and job satisfaction ( $P = 0.001$ ,  $P = 0.049$ ,  $P = 0.0001$ ), respectively (Table 3). Results of the current study showed a significant relationship between DASS21 and existence of pain in participants ( $P < 0.05$ ). Concerning the QoL level of the participants having at least one type of pain, statistical t-test showed no significant difference ( $P > 0.05$ ).

## 5. Discussion

According to the obtained results, a large number (about two-thirds) of the nurses had at least one type of back pain. The results of the current study match with those of the other countries. Mohsenibandpei et al. also confirmed the results of the current study (62%) (30). Dehghanmanshadi et al. indicated that a large number of the dentists (59.5%) had musculoskeletal-pain (more than one type of pain) (31). Coggan et al. indicated that 74.4% of the nurses had back pain. Also the prevalence of nursing associated low back pain was 62.3% (32). Alamgir et al. indicated that the practical nurses had higher injury rates (30.0%) within acute care than the nursing homes (33). According to Smedley 60% of nurses had low back pain and 10% had work absence due to back pain (34).

According to Table 3, there was a significant relationship between the prevalence and non-prevalence of pain and the level of awareness of accurate principles of back care, and applying the principles when performing nursing procedures. The results showed that nurses who adhered to the principles had no pain compared to the ones who did not perform the principles.

**Table 3.** Univariate Analysis of Variance of Quality of Life Subscales and Smoking, Awareness, Exercise and Satisfaction

Variable	Smoking	Awareness of Back Care Principals	Exercise	Job Satisfaction
<b>Perceived quality-of-life</b>				
F	3.77	-	-	-
P value	0.03	-	-	-
<b>Physical function</b>				
F	3.84	-	-	-
P Value	0.03	-	-	-
<b>Pain</b>				
F	-	2.80	-	-
P Value	-	0.03	-	-
<b>General health</b>				
F	-	-	4.23	-
P Value	-	-	0.04	-
<b>Physical component</b>				
F	4.44	-	-	-
P Value	0.02	-	-	-
<b>Social functioning</b>				
F	3.30	-	-	4.26
P Value	0.04	-	-	0.04
<b>Mental component</b>				
F	3.30	-	-	-
P Value	0.04	-	-	-
<b>Stress</b>				
F	-	-	-	5.42
P Value	-	-	-	0.02
<b>Anxiety</b>				
F	3.65	-	-	-
P Value	0.03	-	-	-
<b>Depression</b>				
F	8.31	2.56	-	14.38
P Value	0.001	0.05	-	0.0001

Mohsenibandpei et al. found that considering the relationship between social factors and back pain, it was more widespread among the lower class of the society (30). Some of the studies in this regard showed that social factors played a significant role in the prevalence of back pain. Therefore most of the back pain cases occurred in people with low level of education and social status and awareness (30, 35, 36). In the current study it seemed that high work load and tension, lack of working staff, inappropriate environment of the work place make them disregard their knowledge and awareness relevant to the correct performance of the activities.

Another significant result of the present study was the significant relationship reported between the prevalence and non-prevalence of the pain and depression, but there was no significant relationship between anxiety

and stress (37). The findings of other studies showed that people who are dissatisfied with work are more likely to complain of back pain (5-8).

Also in the study by Mok et al. depression and anxiety were correlated with intensity of pain (38). Dosoglu et al. concluded that the nurses with back pain had depression (39). The study by Smedley et al. showed that low mood is correlated with work absence due to back pain (40). In the study by Duffy et al., linear-regression analyses showed that depressive symptoms had a negative relationship with the QoL (41).

The result of the present study indicated a significant association between the QoL and smoking (42). In this regard, Sarna et al. showed that smokers had lower HRQOL (42). According to the result of the present study there was a significant association between QoL and exercise.

The study by Bauman and Arthur showed that exercise capacity significantly associated with physical subscales of QoL (43). Also result of the present study showed a significant association between QoL and job satisfaction. Results of Cimete et al. and Yu et al. studies were similar with those of the current study results (44, 45).

Low back pain is a multidimensional health problem and many contributing factors can confound the etiology of low back pain. The current study had several limitations such as small sample size, application of the consensus sampling method, and using a self-report questionnaire. The present study found a high prevalence of back pain among nurses. Given that a large number of emergency medical technicians had a kind of back pain, to diminish these problems, it is highly recommended to promote the attitude of EMS individuals to prevent back injury.

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## Authors' Contributions

Study design: Abolfazl Rahimi, and Fatemeh Alhani; analysis and interpretation of data: Abolfazl Rahimi, and Monireh Anoosheh; drafting of the manuscript: Abolfazl Rahimi.

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