

The Turkish adaptation of the emergency medical services resilience scale

The emergency medical services resilience scale

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Abstract

Aim: In this study, we aimed to determine the psychometric properties of the Turkish version of the Emergency Medical Services Resilience Scale.

Material and Methods: This study was methodological and cross-sectional. It was conducted in emergency medical services of five education and research hospitals in Turkey between July-September 2019 with 244 emergency medical service personnel. Data were collected with Sociodemographic Form, the Emergency Medical Services Resilience Scale, and the Cognitive Flexibility Inventory. In the evaluation of the data, explanatory factor analysis, reliability analysis and correlation between scales were tested.

Results: Explanatory factor analysis showed that there are 31 items with a five-factor structure, explaining 47.5% of the variance in the Turkish version of the scale. Cronbach's alpha coefficient was calculated as 0.82.

Discussion: The Emergency Medical Services Resilience Scale is a valid and reliable measurement tool in Turkish culture. It can enable early intervention attempts to be used, especially by managers, to determine the resilience level of emergency medical service personnel in the emergency medical services.

Keywords

Emergency Medical Services; Resilience; Reliability; Validity

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Introduction

Emergency medical services (EMS) are places where emergency medical service personnel work under high levels of stress with unexpected incidents, life-threatening situations and patient deaths. In these overcrowding services, every patient and their families want to feel more important and they have high level of anxiety about their lives [1,2]. EMS personnel help patients and their families in lots of critical conditions. Life-threatening conditions and forcing patients to survive can create stress in EMS personnel, as well as inadequate number of employees, excessive workload, critical patient events and communication deficiencies [1]. This may be more likely to increase the likelihood of stress, distress, anxiety, depression, posttraumatic stress disorder, burnout and dissatisfaction in EMS [2-5]. Khan et al. [6] stated that paramedics had stress (32.0%), depression (31.0%), anxiety (26.0%), insomnia (20.0%), and obstructive sleep apnea (8.0%). DeLucia et al. [7] stated that in their study, which examined the prevalence of posttraumatic stress disorder in emergency physicians in the USA, 15.8% of the participants observed symptoms of posttraumatic stress disorder. Moss et al., [8] on the other hand, reported that mental health is negatively affected because EMS personnel often experience life-threatening cases. Cocker and Joss [9] reported that compassionate fatigue had negative physical and psychological effects on EMS personnel together with general healthcare professionals. They have also proposed new studies to prevent this compassion fatigue, to protect and improve the health of healthcare professionals.

Resilience is the ability of an individual to regain their health and well-being safely and efficiently in expected or unexpected situations [10]. In recent years, being resilience has gained importance to protect and improve the psychosocial health of healthcare professionals. This can lead to adaptive behaviors, new solutions, coping with difficulties, psychological well-being, self-confidence, job satisfaction and leave of job among health professionals. Therefore, resilience may cause positive patient outcomes [4, 11].

Resilience is an important factor for EMS personnel because of challenges in workplaces, psychological problems, insomnia, fatigue, physical and psychosocial difficulties associated with decision-making, conflicts at work, high level of stress, heavy workloads [12]. Resilience is related to recovery from adversity, overcoming setbacks [13]. In different studies conducted with health professionals, there was an inverse relationship between resilience and stress, psychosocial problems, carelessness, and burnout [14,15]. Resilience can make it easier for EMS personnel to maintain their emotional balance with their job, to cope with stressful life events by reducing burnout [4]. Therefore, individuals with high levels of resilience are preferred in the EMS. It is aimed to evaluate and increase resilience levels in places. Culture, behavior patterns, social support systems and individual resilience are effective for EMS personnel [4]. Therefore, due to the need for a standard measurement tool, the resilience scale has been developed in the EMS [4]. Determining the resilience levels of EMS personnel is important and necessary. When the literature is examined, it is seen that the measure of resilience in EMS in Turkey does not have any instrument. In this study, it was aimed to determine

the psychometric properties and transcultural adaptation of the Turkish version of the Emergency Medical Services Resilience Scale (EMSRS).

Material and Methods

Participant and Setting

This study was methodological and cross-sectional. It was conducted in EMS of five education and research hospitals in Turkey between July-September 2019. These hospitals admit about 3500 – 15000 patients per year. The study was conducted with 244 EMS personnel working as physicians, nurses, emergency medical technicians, technicians and health officers on the 31-item scale by considering the number of scale items. For validity and reliability studies, the sample size for each scale item should be 5-10 people. Although the sample size was at least 155 people, the study was completed with 244 participants. Participants who had more than one year of work experience in EMS were included in the study. Also, the EMS personnel with serious mental and physical health problems were excluded from the research. The participants were given a data collection form and asked to complete it. It took 10-15 minutes to complete the data collection form. To evaluate the reliability of the scale, 106 participants were re-tested two weeks after the data collection.

Language Validity

To adapt the scale to Turkish, the translation-back translation method was used. The original version of the EMSRS was translated from English to Turkish by two independent language experts for language validity. In order to evaluate the scale, translated into Turkish as grammar, the opinions of three experts in their fields were taken into account. A common Turkish text was created with expert opinions. It was re-translated from Turkish to English. After the translation was completed, the original scale and translated version of the Turkish to English scale were evaluated in terms of similarities or inconsistencies. After the evaluation, both scales were found to be similar and psychometric analyses was started.

Data collection tools

The Sociodemographic Form, the Emergency Medical Services Resilience Scale, and the Cognitive Flexibility Inventory were used for data collection.

Sociodemographic Form: It consists of questions prepared by researchers that evaluate the participants' characteristics, work experience in the emergency medical services (in years), and total work experience in the profession (in years).

Emergency Medical Services Resilience Scale: It was developed in 2019 by Ebadi et al. [4]. The tool was designed to identify the resilience of the EMS personnel. It is a 5-point Likert-type scale with a total of 31 items. The minimum and maximum score range is 31-155. A high score indicates high resilience. Cronbach's alpha for the original scale was calculated as 0.91.

Cognitive Flexibility Inventory (CFI): It was developed by Dennis and Vander Wal [16] and adapted to Turkish by Gülüm and Dağ [17]. It is designed to produce alternative, harmonious, appropriate and balanced thoughts for people in difficult situations. It was used for evaluating criteria validity. Cronbach's alpha coefficient for the original scale and Turkish version were calculated as 0.91 and 0.94, respectively.

Ethical Consideration

Permission was obtained from the developer of the EMSRS by e-mail in order to use the scale in the study. In order to carry out the study, ethics committee approval was obtained from the local ethics committee (2019/0075; 27.02.2019) and permission was received from the study hospitals. EMS personnel were informed about the study. The personnel who agreed to participate in the study were asked to fill in the data collection forms with their written consent. Participants were told that participation in the study was voluntary, personal information would be kept confidential, and they could be withdrawn at any stage of the study. The study was performed in accordance with the Declaration of Helsinki.

Data Analysis

SPSS 21.0 (SPSS, Inc., Chicago, IL, USA) was used to analyze the data. To define the participants' characteristics, number, percentage, mean and standard deviation values were used. Content and language validity were evaluated for adaptation of the scale. To determine the factor structure of the Turkish form of the EMSRS, explanatory factor analysis (EFA) with varimax rotation was evaluated. The Kaiser-Meyer-Olkin (KMO) and Bartlett's sphericity tests were used to investigate the sample size adequacy. Cronbach's alpha coefficient was used to examine the internal consistency of scale items. The CFI and the EMSRS were compared for criterion validity. For reliability analysis, internal consistency and test-retest measurements were evaluated. To determine the compatibility between the test and re-test, paired sample t- test was used.

Results

The average age of 244 participants was 28.67 ± 6.17 years, and 58.2% (n=142) were women; 61.1% (n=149) of the participants worked as nurses and 23.4% (n=57) worked as physicians, 57.4% had undergraduate education level, 34.8% (n=85) were married and 20.5% (n=50) had children. The average work experiences in EMS and in the profession were determined as 4.19 ± 4.51 and 6.14 ± 6.16 years, respectively.

Validity

The Kaiser-Meyer-Olkin (KMO) coefficient and Bartlett's sphericity test were used to determine the suitability of the data for explanatory factor analysis (EFA). The KMO's higher than 0.60 and the significance of the Bartlett Sphericity test show that the data are suitable for factor analysis [18]. In this study, it was determined that the KMO coefficient was 0.792 and Bartlett's sphericity test was 2692.366 ($p < 0.001$). The results of the KMO coefficient and Bartlett's sphericity test showed that the data are suitable for factor analysis.

To evaluate the construct validity of the EMSRS, EFA was used. The analysis with varimax rotation showed that five factors had values higher than one. The scale explained 47.512% of the total variance. Factor loads of the items on the scale ranged from 0.376-0.809. Factor structure and the factor loads of EMSRS are shown in Table 2. The first factor contained nine items. These items were related to work motivation. The six items related to self-management were created the second factor. The third factor was related to remaining calm at the scene of an accident and contained five items. The fourth factor contained five items related to communication challenges. The

fifth factor contained six items related to the consequences of stress.

Reliability

Cronbach's alpha coefficient was calculated for the reliability of the scale and internal consistency was evaluated. Cronbach's alpha coefficients for test and re-test were 0.825 and 0.859, respectively. According to the paired-samples t- test, there was no difference between test and re-test values of the EMSRS ($t=1.430$; $p=0.156$).

Correlations Between Scales

The EMSRS was applied to EMS personnel with the CFI to evaluate criteria validity. As a result of the correlation analysis, a strong positive correlation was determined between the scales ($r=0.554$, $p < 0.001$).

Discussion

In this study, the psychometric analyses of the Turkish version of EMSRS, which was developed to evaluate the resilience of EMS personnel, were tested.

Before performing factor analysis, it is recommended to examine KMO and Bartlett's test in the literature [18]. When the explanatory factor analysis results of EMSRS were examined, the factor loads of the items were determined between 0.376-0.809, and no item was removed from the scale since there was no factor load below 0.30. [18]. The factor loads determined in this study are similar to the original scale [4]. According to the data obtained from this study, it can be said that the factor load values of the scale are high for EMS personnel. As a result

Table 1. Personal characteristics of the participants

	Mean±SD	Min-Max
Age	28.67± 6.17	19-50
Working experience in the emergency medical service (year)	4.19±4.51	0-30
Working experience in profession (year)	6.14±6.16	0-30
	n	%
Gender		
Female	142	58.2
Male	102	41.8
Occupation		
Nurse	149	61.1
Physician	57	23.4
Emergency medical technician	16	6.6
Health officer	15	6.1
Technician	7	2.9
Education level		
High school	26	10.7
College	42	17.2
Undergraduate	140	57.4
Master	25	10.2
Doctorate	11	4.5
Marital status		
Married	85	34.8
Single	159	65.2
Having children		
Yes	50	20.5
No	194	79.5

Table 2. Factor Loads for the Items of Emergency Medical Services Resilience Scale

Items	Work motivation (1 st factor)	Self-management (2 nd factor)	Remaining calm at the scene of an accident (3 rd factor)	Communication challenges (4 th factor)	Consequence of stress (5 th factor)
15	.780				
16	.732				
14	.669				
17	.569				
18	.556				
20	.488				
26	.440				
2	.377				
28	.376				
7		.809			
6		.793			
9		.690			
8		.637			
5		.552			
4		.403			
23			.686		
22			.649		
25			.490		
24			.453		
27			.435		
11				.676	
13				.586	
12				.556	
10				.532	
1				.478	
31					.649
29					.577
30					.559
21					.537
19					.426
3					.395

of factor analysis, although the original scale was specified as a six- factors structure, in this study, five-factor structures were obtained. Factor structures in the original scale were work motivation (1st, 2nd, 3rd, 4th, 5th, 11th, 12th, 13th, 14th, 15th, 16th, 17th, and 18th items), self-management (6th, 7th, 8th, 9th, and 29th items), remaining calm at the scene of an accident (10th, 23rd, 24th, 30th, and 33rd items), communication challenges (20th, 21st, and 22nd items), social support (25th, and 26th items) and the consequence of stress (36th, 37th, and 38th items), and it explains 51.8% of the variance [4]. The factor structures of this study were determined as work motivation (2nd, 14th, 15th, 16th, 17th, 18th, 20th, 26th, and 28th items), self-management (4th, 5th, 6th, 7th, 8th, and 9th items), remaining calm (22nd, 23rd, 24th, 25th, and 27th items), communication challenges (1st, 10th, 11th, 12th, and 13th items) and consequence of stress (3rd, 19th, 21st, 29th, 30th, and 31st items). When the two items of the social support factor in the original scale were evaluated in terms of factor loads and semantic integrity, they were evaluated in the remaining calm factor in this study. Due to the five-factor structure of the scale, the items applied to professionals cover 47.512% of the total variance. In the validity and reliability analysis, the factor analysis is the most common method used to test the construct

validity [19], and it is recommended that the variance described in the literature should be between 40-60% [20]. In this study, it was found that the construct validity of the scale was provided with its five-factor structure in Turkish culture. Internal consistency of items was evaluated with Cronbach's alpha of the reliability of the scale. In the literature, it was stated that the acceptable value of Cronbach's alpha for internal consistency should be over 0.70. [21,22]. In this study, Cronbach's alpha was determined as 0.82. It was found as 0.91 on the original scale [4]. Since it was suggested in the literature that the test should be used again with the same group at two-six weeks interval in order to evaluate the stability of the scales against time [23], in this study, re-test was performed two weeks later, and Cronbach's alpha coefficient was determined as 0.85 in re-test. When the test and re-test results are compared, it was seen that the results were similar, and the reliability of the scale was provided with the current version. In the literature, it was stated that the correlation of the scales should be at least 0.30 for criterion validity [20]. In this study, the CFI was used to evaluate the criterion validity of the scale. The correlation between EMSRS and CFI was calculated and the accuracy of the scale was tested. It was found that there was a

statistically significant strong correlation between EMSRS and CFI and a value above 0.30, therefore, the criterion validity of the scale is provided.

There are different measurement tools in the literature for measuring resilience [24]. Their general characteristics are based on answers given by the individuals. Therefore, resilience is affected by cultural differences [25]. Although, in this study, the measurement of resilience for emergency medical services personnel was self-reported, the results were similar with the original scale.

Limitations

This study has some limitations. Psychological factors that may affect EMC personnel's flexibility have not been investigated. The scale, whose validity and reliability was completed with this study, is valid only for Turkish society.

Conclusions

The data obtained from this study showed that EMSRS can be used to determine the resilience levels of EMS personnel. The results of this study were relative with the original scale. Cronbach's alpha internal consistency coefficient, test-retest analysis, and equivalent form analysis showed reliability.

Scientific Responsibility Statement

The authors declare that they are responsible for the article's scientific content including study design, data collection, analysis and interpretation, writing, some of the main line, or all of the preparation and scientific review of the contents and approval of the final version of the article.

Animal and human rights statement

All procedures performed in this study were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards. No animal or human studies were carried out by the authors for this article.

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Conflict of interest

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