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Relationship between perceived stress and personality traits in emergency medical personnel

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Abstract

Introduction: Emergency Medical Personnel (EMP) perform their duties to take care of critically-ill patients in stressful situations. It is not clear what kind of personality traits have negative relationships with perceived stress. The aim of this study is to identify paramedics who are able to maintain their work performances at high levels despite facing stressful situations.

Materials and Methods: This study was conducted on emergency medical personnel from March to September 2015. This was a correlational study in which the convenience sampling method was used to select 120 men as the sample. Research instrument included demographic form, NEO Five-Factor Inventory and Cohen's Perceived Stress Scale were employed to collect data which were then analyzed via descriptive and inferential statistics (correlation and regression) in SPSS software version 16.0.

Results: The results revealed that Neuroticism (N) was significantly and positively correlated with perceived stress. However, extraversion (E), agreeableness (A), conscientiousness (C) were negatively correlated with the perceived stress scale (P<0.001). Moreover, neuroticism (N), openness to experience (O), agreeableness (A) and conscientiousness (C) included 59.5% of variances in perceived stress.

Conclusion: It seems that among emergency medical personnel, those who were more emotionally stable, more responsible and more willing to help people have lower perceived stress and they perform their duties more efficiently.

Keywords: Emergency Medical Services, Personality, Stress, Work Performance

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Introduction

Emergency medical personnel experience one of the most stressful medical occupations (1,2). One of the stressful issues of this profession is that the personnel are always in contact with critically-ill patients who go through life-threatening conditions. Furthermore, these personnel are always prone to various risks. They may also be attacked by patients with mental disorders and aggression or threatened by road accidents (3). On the other hand, they may experience some problems related to the acute and chronic types of stress (4,5). Threatening their mental health very badly, stress leaves them with significantly negative consequences, some of which include decline in productivity and services, health problems, absenteeism, turnover and the use of substances and psychedelic drugs (1).

Personality can have an important role in work performance because it determines an individual's motivation and attitude towards the job and the way he or she responds to the job requirements (6). Some personality traits of employees are among the most important factors resulting in the perception of job stress. In other words, what is stressful to someone may not be important to someone else. Put another way, the perceived stress depends on an individual's perception of the environment. Therefore, stress is perceived when the threatening environment is inferred (7). Vollrath indicated that people with neuroticism (N) experienced more stressful incidents. On the contrary, extroverts have both more stressful and pleasant experiences (8). Naturally, it can be predicted that such individuals will develop different personality types and behavioral adjustment or maladjustment to deal with stress (9). Navidian et al. indicated that there was a negative correlation between the general health and the levels of job

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stress among emergency medical personnel at Zahedan University of Medical Sciences (10).

Regarding the stress level of EMP, some studies show that this profession is stressful. A study in the US indicated that only 10% of EMP experienced a low level of stress, although 80 % of the personnel showed medium and high levels of stress (4). In Iran, it was indicated that 74.8% of the personnel experienced a medium level of stress (5). It is worth mentioning that these studies investigated the roles of environmental factors such as working conditions in stress among employees; however, they were not concentrated on the interaction of stress with employees' personalities and their coping responses (4, 5, 10 and 11). Therefore, it is really necessary to deal with individual factors such as employees' personalities. Moreover, the direct and indirect costs of the destructive complications of job stress are also significant (1). More importantly, their mortality rate is very much higher than that of the general population. In other words, the mortality rate of EMP in the US is 12.7 per 100000 people, a rate which is five times as the general rate (12). Ebrahimi et al. indicated that nearly half of the EMP in Shahrood County experienced the medium levels of occupational burnout which increased by age and working experience (13). The quality of working life was reported low among the EMP in Kerman (14).

Medical emergencies cause conditions for tension among employees due to time limits on the affairs, the critical status of a patient, companions' expectations, open workplaces, fear of incompetence in saving the life of a dying patient, decision-making power in critical conditions and factors related to human resources. Considering the key roles of EMP in the health system and their critical importance in human life and health, the question is whether it is better these personnel have such personalities that they can reach the highest performance without negative consequences and occupational burnout in stressful situations. Therefore, the aim of this study is to investigate the relationship between personality traits and perceived stress among emergency medical personnel.

Materials and Methods

This cross-sectional study has a correlational-descriptive design which was conducted in six months from March to August 2015. It was approved by the Ethics Committee of the Research Department at Islamic Azad University Shahrood Branch with the informed consent of emergency medical experts in Razavi Khorasan Province. The EMP were assured that the research results would be published only in general. The statistical population included all the EMP working in emergency stations in Razavi Khorasan Province (Mashhad, Neyshabur, Sabzevar, Quchan, Torbat-e-Jam, Torbat-e-Heydarieh, Taybad, Chenaran, Dargaz, Fariman, Bakharz and Khaf). The convenience sampling method was used to select 190 individuals as the research sample. The researcher first contacted the EMP after their working hours to explain the research goal and provided them with the questionnaire. If they met the inclusion criteria, they would participate in the study. The inclusion criteria were the participant's consent, the minimum 2-year working experience in medical emergency stations, an associate's or a higher degree in medical emergency, not experiencing the death of any relatives or parents in the last month and not going on vacation in the last month. The exclusion criteria were the requests of research units indicating the refusal to participate in the study, incomplete questionnaires or the illegibility of information inserted by a participant.

Research instruments

- *NEO Five-Factor Inventory (NEO-FFI):* The abridged form of NEO-FFI includes 60 items. Like the full form, this abridged one evaluates five personality factors (Neuroticism, Extraversion, Openness to experience, Agreeableness and Conscientiousness). The Big Five personality traits were developed by Costa and McCrae in 1989. It is an intelligent summary of the 180-item form. In the abridged from, each factor includes 12 items. The Likert scale was used to rank the choices from 0 (totally disagree) to 4 (totally agree), although some items were scored inversely. Based on the mean and standard deviation, the scores were turned into z ($Z=(X-\ddot{X})/SD$), then the result was changed to T with a mean which was 50±10. The scores above 55, from 45 to 55 and below 45 were considered high, medium and low, respectively. The validity and reliability of this questionnaire were confirmed by McCrae et al. (1989). The next studies did not make a significant change in the validation results of the questionnaire (15). In Iran, Roshan Chesli et al. (2006) and Khormaee and Farmani (2014) showed that the reliability of this questionnaire was acceptable in general (16,17).

- *Cohen's Perceived Stress Scale:* Cohen's perceived stress scale was first presented by Cohen et al. (1983). This tool was codified to determine how much individuals could identify stress in unpredictable and uncontrollable situations of life. It has three 4-item, 10-item and 14-item versions. In

this study, the 14-version item was used. The responses were scored with the five-point Likert scale. Ranging from Never to Always, a score was allocated from 0 to 4 to each item (although some items were inversely scored). The score domain ranges from 0 to 56, and higher scores indicate that an individual perceives stress more. This scale does not have ranking scores and a cut-off point. It is appropriate for the comparison of perceived stress levels in different populations. The reliability and validity of this scale was confirmed by Cohen et al. (14) Asadi et al. reported the Chronbach's alpha to be 0.84 in their study (7). Safaei and Shokri (2004) indicated that this tool was acceptably valid (8).

GPower was used for the correlation bivariate normal model: post hoc to show that the research power was 92% (more than 80%), a fact which indicated the sufficiency of the size of the sample. The research sample was described with absolute and relative frequencies, mean, variance and the standard deviation of the perceived stress scale to analyze data. Then age, working experience and educational attainment were taken into account to describe the personality of employees. Given the fact that the data was non-normal, Pearson product-moment correlation coefficient was employed to find the relationship between the perceived stress score (relative) and the personality trait score (spatial). Finally, SPSS 16 was used to analyze data.

Results

The average age of the research sample was 29.77±5.53, and the age ranged from 22 and 46 (24 years). All the research subjects were male, out of whom 142 individuals (74.7%) had associate's degrees and 48 individuals (25.3%) had bachelor degrees. The average working experience in medical emergency was about 6.15±4.33 with a middle of 5 years. The range of working experience was 24 years, and 90% of the subjects were working less than 10 years.

The average perceived stress levels of the research sample was around 21 (21.86±5.91) with a middle of 23, and the stress ranged from 6 to 38 (32) (Figure 1).

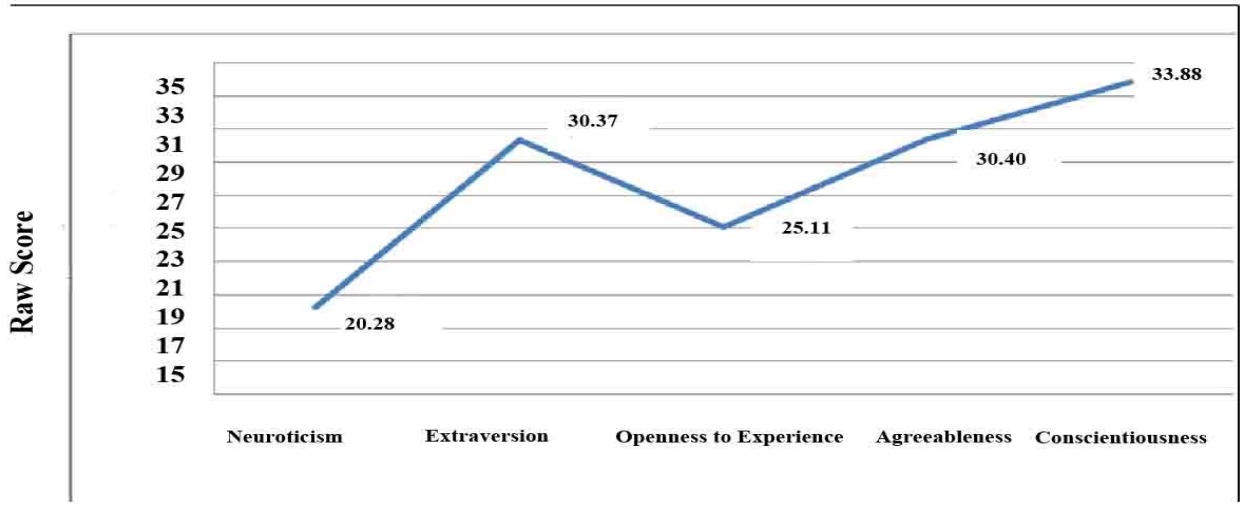

Figure 1. The means of raw scores for the personality traits of the EMP in the short form NEO-FFI

The mean of scores on NEO checklist was average for the research sample. The scores of NEO checklist were calculated for each individual. Then the general mean was obtained in each trait. Converting the mean of raw scores to T resulted in an average score for each trait (Table 1).

Table 1. The Relationship between the Perceived Stress and Personality Traits among the EMP

Personality Trait	Raw Score (Mean and SD)	T Score (Mean and SD)	Spearman R Statistics	Significance Level
Neuroticism	20.28±6.28	50.01±10.01	0.674	<0.001
Extraversion	30.37±5.37	50.02±10.01	-0.505	<0.001
Openness to experience	25.11±4.41	50.01±10.01	0.065	0.376
Agreeableness	30.40±4.66	50.00±10.01	-0.541	<0.001
Conscientiousness	33.88±5.61	50.01±10.02	-0.667	<0.001

The Pearson correlation test indicated that there was a positive and significant relationship between the perceived stress and neuroticism. There was a positive and insignificant relationship between the

perceived stress and openness to experience. In other words, the subjects with higher neuroticism scores perceived more stress. On the other hand, the perceived stress had negative and significant relationships with extraversion, agreeableness and conscientiousness. Therefore, the subjects with higher scores in these traits experienced lower levels of stress (Table 1).

Considering the non-normality of the perceived stress scores, the predicting variables of perceived stress were explained with the Enter model after converting data and conducting the multivariate regression test. It should be mentioned that no significant relationships were found in the comparison between age and stress, educational attainment and stress or age and personality traits. The findings of Table 2 indicate that the multivariate correlation coefficient (R) was good enough to predict stress, insofar as the coefficient of determination (R^2) showed that 59.5% of changes in the dependent variable (perceived stress) could be explained by the independent variable (personality traits). Moreover, the one-way analysis of variance indicated that the independent variables predicted stress directly ($F(5,184)=53.97$, $P<0.001$). Given the multivariate regression coefficients, the following equation can be suggested. The coefficient of extraversion was not significant; therefore, it was deleted from the equation.

Table 2. The summary of multivariate regression model

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	0.771	0.595	0.584	3.77601

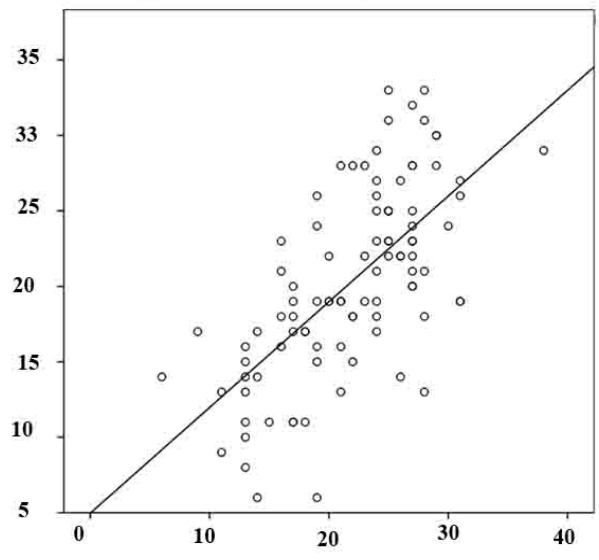

Figure 2. The correlation of stress score with neuroticism

Discussion

Regarding the perceived stress with the mean of 21, the research results indicated that EMP had a medium level of stress. Although no cut-off points and standard classifications have been recommended for Cohen's perceived stress scale, and the results of this scale should be compared with other values, some studies have reported other values, ranging from 15 to 28, for the medium stress level (9). Therefore, in comparison with other studies, there has not been a study to evaluate EMP stress with Cohen's perceived stress scale. Given the fact that 50% of the subjects were below 28 years old, the most similar studies, employing Cohen' scale, were the ones conducted on the students of Medical Sciences Universities. These studies included values between 18 and 25 (9, 18 and 19). Thus, it can be concluded that the stress levels of EMP was in the range of ordinary people in medical sciences majors in this study. The scores of fifty percent of the research subjects were higher than 23, a fact which indicated the medium stress level. Other relevant studies have reported the stress levels of EMP to be at medium or higher levels. In the US, West indicated that 80% of EMP had medium and high stress levels. In Iran, Seyed Javadi et al. showed that the stress level of the majority of employees (74.8%) were medium (20,21). There are various causes for stress. They have been reported to include diseases, insufficient rest, lack of equipment, inaccurate evaluation of work, insufficient personnel, expose to pollutants and the type of employment (10). It is obvious that job stress can be inversely related to the general health of EMP (22). It can have significant side effects on employees such as reduction in productivity and services, health problems, absenteeism, turnover, and the use of drugs and psychedelic substances. Moreover, the direct and indirect costs of destructive side effects should be taken into account in relation to job stress (1).

The research results indicated that the personality of EMP could be the predictor of their perceived stress. Furthermore, ANOVA showed that personality traits predicted stress significantly in a way that 60% of changes in the perceived stress could be explained by personality traits (Table 2). Nurses (11%) have been reported to show a much higher value (23). There was a positive and significant relationship between neuroticism and the perceived stress; however, the perceived stress had negative and significant relationships with extraversion, agreeableness and conscientiousness.

Various consistent studies indicated that neuroticism had a positive and significant relationship with the perceived stress, and people with this trait experienced more stressful incidents (24). The studies of personality traits and its relationship with stress in nurses showed that neuroticism had a positive and significant relationship with job stress among them. However, it should be mentioned that the coefficients of this relationship were (0, 29) and (0, 31) among nurses. This relationship is much weaker than that of EMP (0, 67) which showed a stronger relationship (23,25). Moreover, this trait could predict stress among EMP and nurses with a regression coefficient of (0, 30) (Table 2). People with neuroticism are prone to worries, stimulation and anger towards other people. They are less able to control their pulses and manage stress (26). Therefore, these people face various difficulties in the medical emergency environments in which there are many stressful stimuli such as taking care of a critically-ill patient. This shows that there should be a very strong relationship between neuroticism and the perceived stress. In this regard, the value of traumatic stress disorder had a direct and significant relationship with this trait in EMP (27).

The results also indicated that there was a negative and significant relationship between extraversion and the perceived stress in EMP (Figure 2). In nurses, this trait had an insignificant and positive correlation (0.019) and a negative correlation (-0.21) with stress (27 and 28). However, the correlation is much weaker that what was obtained for EMP (-0.50). This means that extroverts have more pleasant experiences in a way that this trait provides an individual with more positive emotions, active coping mechanisms and social support (24). This trait also makes people have friendly relationships with others so that they can easily stand crowded environments. Their self-expressive abilities let them be able to express themselves whenever necessary (26). In fact, this trait is very much necessary for EMP because they should be able to have appropriate relationships with clients and their families. They should also be able to have appropriate interactions in missions to attract people's cooperation.

The research results indicated that openness to experience had a positive and insignificant relationship with the perceived stress among EMP. In nurses, this trait had an insignificant and positive (0.062) and negative (-0.17) correlation with the perceived stress. This is very similar to the relationship which was obtained for EMP (0.06) (23,25). Moreover, this trait could predict stress among EMP with a regression coefficient of 0.24 (Table 2). These individuals were interested in arts. They rarely welcomed new and various activities, and they were more conservative (26). Sometimes, this trait does not help the EMP much because artistic activities do not definitely have a role in medical emergencies. Therefore, there was not a significant relationship between this trait and the perceived stress.

The research results indicated that agreeableness had a negative and significant relationship with the perceived stress among the EMP. In nurses, this trait had negative and insignificant correlations (-0.08) and (-0.05), which were much weaker that the relationship reported among the EMP (-0.54) (23,25). Moreover, this trait could predict the stress among the EMP with a regression of (0.25) (Table 2). These individuals are so optimistic and can easily trust others. This trait does not let them take advantage of each other and prevent having conflict with others. They can also forgive others (26). It is obvious that this trait is very helpful for the EMP. Working in the emergency stations and participating in operations performed on the critically-ill patients who are not able to defend themselves would make the presences of these individuals more essential. Moreover, individuals who avoid conflict are very useful for emergency missions because it is necessary for the EMP to obey the orders and avoid conflicts in missions. This trend makes the missions be fulfilled better as the product of teamwork.

The research results indicated that conscientiousness of the EMP had a negative and significant relationship with the perceived stress. In nurses, this trait had insignificant and negative (-0.14) and positive (0.03) correlations, which are much weaker than the relationship reported for the EMP (-0.66) (23,25). Furthermore, this trait could predict the stress among the EMP with a regression coefficient of 0.34 (Table 2). Conscientious people are able to make efficient decisions. They can organize their tasks very well. Being very meticulous, they think before every action (26). Such individuals are very efficient in medical emergency activities because these missions are filled with situations requiring intelligent decisions which should consider all aspects. Moreover, dealing with critically-ill patients requires employees who can take care of them meticulously and appropriately to mitigate the effects of injury among them.

The research suggestions and limitations can be related to population, tools and research variables.

In this study, the abridged form (including 60 items) of NEO personality checklist was used. Although the reliability and validity of this tool were confirmed in many studies, the 240-item version can have higher validity and clarify more aspects about the personality of the EMP. Conducting the 240-item form requires time, validity and the considerable cooperation of personnel, a fact which was not possible for the research team. This can be done in the next studies. Moreover, Cohen's perceived stress scale was used in this study. It was not feasible to employ the physiological criteria for stress such as the serum cortisol level or saliva. These criteria can be used in the next studies to assure more validity. This study can be carried out on a larger sample size in different cultures and various fields of medical science. Finally, NEO personality traits can be studied to ascertain how they are related to occupational successes in medical emergencies and what personality traits can be prominent in a medical emergency expert. It is suggested that psychological interventions should be planned for people with neuroticism in order to reduce their stress levels. It is also advised to investigate and consider the personality profile of applicants in the recruitment of the medical emergency personnel.

Conclusion

All in all, it can be stated that personality traits are directly and significantly related to the perceived stress among the EMP. This relationship is very much stronger in comparison with other fields of the medical sciences. Therefore, NEO personality inventory is a very valuable tool to identify the personality traits of the EMP.

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