

Multiple Correlations of Resilience with Self-Compassion, Self-Control, and Problem-Solving Styles in Emergency Medical Services (EMS) Workers in Isfahan, Iran

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Abstract

Background: Resilience refers to human ability for adapting to disasters, traumas, pain, and suffering from important troubles and stressors in life.

Objectives: Regarding the fact that people are continuously exposed to various physical and mental health traumatic stimuli, this study aimed to investigate the resilience correlations in Emergency Medical Services (EMS) workers.

Methods: The study was descriptive-correlation which examined 15 individuals for each scale and subscale. Therefore, 150 EMS workers were selected for this study.

Results: All four variables, including resilience, self-control, problem-solving style, and self-compassion, were above average. Resilience had a positive and significant correlation with self-control, problem-solving, creativity, confidence in problem-solving, and tendency (a subscale of problem-solving). Self-control had a positive and significant correlation with self-compassion. The final model was as resilience = 0.454 + 41.317 [15.941 + 0.622 (self-compassion)] + 3.453 (tendency) + 3.255 (creativity).

Conclusion: According to the findings of the present study, it is suggested to strengthen four variables of resilience, self-compassion, self-control, and problem-solving styles in the EMS personnel.

Keywords: Resilience, Self-Compassion, Self-Control, Problem-Solving Styles, Emergency Medical Services

1. Background

Resilience refers to the ability for adapting to changes.¹ Some researchers have used this concept for the health workers and reported that it is the ability to maintain personal and professional welfare to cope with stress and adversity at work.² This concept is not only associated with the personality characteristics (personal satisfaction, perseverance, self-confidence, self-compassion, self-control, problem-solving styles, and commitment), but it is related to the external factors (working conditions and relationships between people).³

Resilience is known as a protective factor against the mental health problems which plays a useful role to reduce the job burnout and perceived workload in the emergency department, especially EMS.⁴ Self-compassion is a factor which helps facilitate resilience as its important predictor.⁵ It refers to the ability to behave ourselves with the same kindness and compassion which we treat others in similar situations, indicating that the

people with self-compassion have a higher level of resilience and better adapt and recover when they face stress or problems.⁶

Self-control is a way of self-management by which people oblige themselves to do or leave certain acts.⁷ High self-control people are better at stopping and starting.⁸ High self-control makes individuals calmer, promotes collaboration, and stops unneeded impulses toward automatic actions. It also reduces the impact of a bad environment on unwanted results.⁹ Self-control is a regulatory mechanism between internal biological impulses and external cultural requirements.¹⁰

Problem-solving skill is a vital emergency aspect.¹¹ In the clinical setting, problem-solving is the ability to make decisions which plan for the correct action based on proper knowledge.¹² People with problem-solving skills should have personal characteristics, such as innovation, the clear expression of preferences and decisions, a sense of responsibility, flexible thinking, courage, and adventure.¹³

People find the effective ways for adapting to the situations and events which lead to communicative behavioral reactions, using problem-solving as a cognitive-behavioral structure and process.¹⁴

EMS technicians and paramedics are frequently exposed to traumatic events, such as violence, suicide, severe injuries, and death. In a survey, 82% of EMS personnel reported experiencing a specific distressing event.¹⁵ A meta-analysis of 30878 EMS personnel estimated the prevalence of stress to be 11%. This estimation is higher than stress among the general population.¹⁶ The symptoms, such as anger, hostility, sleep disorders, and avoidance can significantly disrupt the individual's personality. The stressful workplace of EMS technicians causes the health risks, such as obesity, sleep problems, and cardiovascular diseases.¹⁷

Given the aforementioned cases and the fact that the presence of a stressful place is a source of problems for EMS workers in need of empowerment, the present study sought to determine the multiple correlations between resilience, self-compassion, self-control, and problem-solving styles among EMS workers in Isfahan.

2. Objectives

Regarding the fact that people are continuously exposed to various physical and mental health traumatic stimuli, this study aimed to investigate the resilience correlations in EMS workers.

3. Methods

The present descriptive-correlation study examined all EMS workers in 2021. Considering that the research was correlational, 15 individuals were used for each scale and subscale.¹⁸

After confirming this research by the Ethical Committee of Isfahan University of Medical Sciences, the researcher visited the research place (Emergency Medical Services). Since the research had 10 scales and subscales (15 individuals were included in the study for each subscale), 150 EMS workers were selected from all centers in Isfahan using the simple random sampling method.

After receiving a full list of EMS workers' names and contact numbers, and placing the questionnaires on the online website for responding to the questionnaire, the researcher sent messages about research objectives and the link to questions to workers. By clicking the link, the employees gave their informed permission, and all of their surveys that were fully completed were examined. The inclusion criteria of study were as follows: The satisfaction to participate in the study and EMS workers who had more than three years of work experience. Exclusion criteria: Uncompleted questionnaires, and employees who were unsatisfied to participate in the study.

Data on the variables were collected by four standard questionnaires. The questionnaires included 25-item resilience scale (Connor and Davidson, 2003), 13-item self-control scale by Tangney (2004), problem-solving style questionnaire by Cassidy and Long (1996), and self-compassion scale (SCS) by Doris et al. (2011).

3.1. The 25-item Resilience Scale (Connor and Davidson, 2003)

This questionnaire has 25 items which are scored on a Likert scale from zero (totally disagree) to five (totally agree). The score of each participant is equal to the sum of the scores or the total values obtained from the questions; hence, the minimum score of this questionnaire is 0 and the maximum is 100.

This questionnaire does not have sub-variables, but factor analysis has extracted the five following factors. The competence of personal strength, the confidence in personal instincts, tolerance of negative emotions, the positive acceptance of emotions of secure relationships, restraint, and spirituality. The validity and reliability of questionnaire were confirmed by Besharat et al. (2008), Rahimian-bogar (2008), Jokar (2010), Keyhani et al. (2004), and Arefi (2005). The reliability of the questionnaire was examined in the study by Besharat et al. (2008) using the Cronbach's alpha coefficient test, and an alpha of 0.84 was found. Even though the internal consistency, retest reliability, and convergent and divergent validity of the scale are sufficient, and the results of exploratory factor analysis indicate the presence of five factors, namely competence, personal strength, confidence in personal instincts, tolerance of negative emotions, positive acceptance of emotions, safe relationships, inhibition, and spirituality for the resilience scale, the overall resilience score is considered valid for research purposes since the reliability and validity of the sub-variables are not definitively confirmed.

Removing each item from all items decreased Cronbach's alpha, but the reduction was negligible in cases, such as items 2, 3, 9, and 20. According to higher alpha coefficient obtained from the ideal criterion of 0.7 and the reduction of these coefficients in the case of removing each item, it can be concluded that the resilience scale (25-item form) had a desirable state in terms of internal consistency and the questionnaire had proper internal reliability. Cronbach's alpha coefficient was calculated and was equal to 0.89.

3.2. 13-item Self-Control Questionnaire by Tangney (2004)

This questionnaire contains 13 items and its scoring includes "never true for me" with a score of 1, "to some extent" with a score of 2, "sometimes" with a score of 3, "often" with a score of 4, and "always" with a score of 5, and the questions 2, 3, 4, 5, 7, 9, 10, 12, and 13 are

reversely scored. The reliability of questionnaire was reported to be 0.91, and other studies reported the reliability of 0.80 using Cronbach's alpha method. The maximum self-control score was 65 and the minimum was 13. A higher score indicated higher self-control.

The validity and reliability of questionnaire were obtained equal to 0.86 and 0.89 respectively in Hosseinali's study (2019). Cronbach's alpha coefficient was equal to 0.92.

3.3. Problem-Solving Style Questionnaire by Cassidy and Long (1996)

This questionnaire contains 24 items which measures six factors and the participants answer yes or no to each item. The six factors include the helplessness (feeling of helplessness and inability in problematic situations), problem-solving control style (external-internal control dimension), creativity style (planning for various solutions), confidence style in problem-solving (belief in individual ability to solve problems), avoidance style (avoiding problems instead of confronting them), and the tendency style (tendency to confront and solve problems). Each factor with four questions will have a score between zero and four since the sum of the points is the final score for each of the six factors. Mohammadi and Sahebi (2008) reported the reliability of this scale by the internal consistency (Cronbach's alpha) of 0.60. According to a study by Babapour and Ejei (2011), Cronbach's alpha coefficient was 0.77 and its reliability coefficient was 0.87. Cronbach's alpha coefficient was equal to 0.87.

3.4. Self-Compassion Scale (SCS) by Doris et al. (2011)

This scale contains 12 items, developed by Doris et al. in 2011. It has six two-sided factors, including self-kindness, self-judgment, common humanity, isolation, mindfulness, and over-identification. This questionnaire is graded from 1 to 5 on a Likert scale. In a study by Shahbazi et al. (2014), the scale's overall score has a

Cronbach's alpha value of 0.91. The questionnaire's concurrent and convergent validity were both noted as desired, and the Cronbach's alpha value was 0.91. The mean and standard deviation were used for qualitative data, and the distribution and frequency percentage for quantitative data.

All participants were assured that their information would be kept confidential and the researcher would not use the data in another study.

All analyses were performed using SPSS 22 at a significance level of less than 0.05 and according to correlation coefficient tests and stepwise regression.

4. Results

All EMS workers were men, their mean age was 34.64 ± 5.87 years, and their work experience was 12.98 ± 3.81 years. Table 1 presents the mean ± standard deviation of variables.

Table 1. Mean ± Standard Deviation of Research Variables

Variables	Mean ± SD
Age, year	34.64 ± 5.87
Work Experience, year	12.98 ± 3.81
Resilience	75.12 ± 19.18
Self-Control	40.81 ± 9.04
Problem-Solving Styles	15.14 ± 2.68
Helplessness	2.93 ± 0.94
Problem-solving control style	2.58 ± 0.89
Creativity style	2.74 ± 0.97
Confidence in problem-solving style	2.38 ± 1.12
Avoidance style	2.66 ± 0.97
Tendency style	2.38 ± 0.92
Self-Compassion	40.14 ± 6.35

In Table 2, all four variables of resilience, self-control, problem-solving style, and self-compassion are above average.

Results of the Pearson correlation have been presented in Table 2. Self-control ($p = 0.0001$, $r = 0.317$), problem-solving skills ($p = 0.002$, $r = 0.216$), creativity ($p = 0.036$, $r = 0.172$), confidence in problem-solving ($p = 0.007$, $r = 0.220$), and propensity ($p = 0.008$, $r = 0.216$) all showed a

Table 2. Pearson Correlation Results between Predictive and Criterion Variables

variables	Resilience	Self-Control	Problem-Solving	Helplessness	Problem-solving control	Creativity	Confidence in problem-solving	Avoidance	Tendency	Self-Compassion
Resilience	1	0.002	0.002	0.171	0.056	0.036	0.007	0.090	0.008	0.080
Self-Control		1	0.358	0.745	0.190	0.432	0.184	0.095	0.081	0.0001
Problem-Solving			1	0.001	0.001	0.001	0.001	0.001	0.001	0.001
Helplessness				1	0.298	0.953	0.212	0.298	0.377	0.660
Problem-solving control					1	0.385	0.539	0.402	0.927	0.785
Creativity						1	0.654	0.059	0.870	0.187
Confidence in problem-solving							1	0.001	0.534	0.091
Avoidance								1	0.045	0.645
Tendency									1	0.090
Self-Compassion										1

Table 3. Regression Results for Predicting Resilience with Self-Control, Problem-Solving, Creativity, Confidence in Problem-Solving, and Tendency

Step	Variable of the question	Regression coefficient	Square of the regression coefficient	F	Degree of freedom 1	Significance level
1	Self-Control	3325.051	3325.051	9.555	1	0.002
2	Problem-solving control	1344.405	1344.405	3.720	1	0.056
3	Creativity	1614.919	1614.919	4.492	1	0.036
4	Confidence in problem-solving	1059.686	1059.686	2.917	1	0.090
5	Tendency	2552.870	2552.870	7.228	1	0.008

positive and substantial link with resilience (as the problem-solving subscales). Self-control had a positive and significant correlation with self-compassion ($p = 0.0001$, $r = 0.437$).

Table 3 presents the results of regression to predict resilience with self-control, problem-solving, creativity, confidence in problem-solving, and tendency. The resilience regression model with three variables (self-control, creativity, and tendency) was significant and the

best predictor for resilience. Table 4 presents the importance of each variable in the five-factor model.

As it has been presented in Table 3, the parameters of the model, including the intercept and the regression coefficients were equal to 0.454, 3.255, and 3.453 for self-control, creativity, and tendency respectively; hence, the regression model was as follows:

$$\text{Resilience} = 41.317 + 0.454 (\text{self-control}) + 3.453 (\text{tendency}) + 3.255 (\text{creativity})$$

Table 4. Raw and Standard Coefficients of the Regression Equation for Predicting Resilience with Self-Control, Problem-Solving, Creativity, Confidence in Problem-Solving, and Tendency

Variable	Raw coefficient (B)	Standard error	Beta coefficient	T	Significance level
Constant	41.317	10.336	-	3.997	0.0001
Self-Control	0.454	0.166	0.214	2.731	0.007
Problem-solving control	3.728	1.645	0.175	2.266	0.125
Creativity	3.255	1.523	0.166	2.137	0.034
Confidence in problem-solving	2.368	1.557	0.120	1.521	0.131
Tendency	3.453	1.619	0.166	2.133	0.035

This model indicated the positive correlation of resilience with the tendency and creativity for solving problems, and self-control. The three factors had significant impacts on resilience, according to the t-test. Additionally, beta coefficients showed that variations in the variance of self-control were correlated with variations in the standard deviation of self-control, creativity, and tendency, respectively. Table 2 indicated that self-control had a positive and significant correlation with self-compassion as follows.

$$\text{Self-control} = 15.941 + 0.622 (\text{self-compassion})$$

Therefore, the final model was as follows:

$$\text{Resilience} = 0.454 + 41.317 [0.622 + 15.941 (\text{self-compassion})] + 3.453 (\text{tendency}) + 3.255 (\text{creativity})$$

5. Discussion

The research results indicated that there was a positive and significant correlation among resilience, tendency, and creativity to solve problems, and self-control. A positive and significant correlation was found between self-control and self-compassion. As a result, resilience means a person's positive psychological capability to adjust to stresses as well as their power to overcome anxiety after exposure to a traumatic experience. These individuals have an internal locus of control and optimistic outlooks on life since they accept responsibility for their circumstances and problems dealing with stress. Several studies are consistent with this study. In a study

by Mohammadi and Amini on adolescent delinquents in Bushehr, they indicated that self-control had a significant effect on resilience.¹⁸ Heydari and Hemmati Rad (2021) conducted a study on Karaji elderly people and found that emotional self-control was effective to increase their resilience.¹⁹ According to Eta squared, 85.7% of the changes were in terms of the effect of emotional self-control.

The study results of Roohi et al. (2019) indicated that there was a positive and significant correlation between resilience and self-control.²⁰ Self-control can play a mediating role in the relationship between resilience and emotion regulation.

In a study on the students of Alborz University of Medical Sciences, Norouzinia et al. (2017) reported that there was a significant relationship between resilience and locus of control, in other words, resilient people had an internal locus of control.²¹

Rahmati and Saber (2018) studied drug-addicted men and reported that drug-addicted people with high resilience had higher self-control and resistance against the temptation of drugs.²² The results indicated that people who had self-compassion had a more positive and kind view, while facing unfortunate situations and failures. Therefore, they can experience emotions instead of self-judgment and self-blaming, and they seek to find a suitable solution to solve their problems instead of running away from negative emotions, and this result was partially consistent with this study's results. In both

studies, people with higher self-compassion also had higher self-control.

There was no significant relationship between self-compassion and problem-solving. The inconsistency of the results of two studies might be in terms of the differences in samples of two studies. EMS workers were surveyed and they needed to be trained to have self-control in all critical and non-critical situations which have an appropriate problem-solving style based on the nature of their jobs.

Behzadpoor et al. (2014) conducted a study on the students of Tehran and reported that the students with high academic achievement showed a significant relationship between resilience and creative problem-solving style, and the results were consistent with the present study.²³ Additionally, creative problem-solving included preparing and taking into account several options, and it resulted in improved resilience in EMS personnel depending on the difficult scenario. In emergencies, their adaptability and speed of response were boosted through creative problem-solving. The tendency to solve problems referred to having a positive attitude towards problems and the desire to deal with them face to face, which had a significant relationship with resilience in the present study.

In a systematic study, Biber and Ellis (2019) determined the effect of self-compassion on self-control of health behaviors.²⁴ The results of different studies indicated that self-compassion interventions were as effective as other behavior change techniques to improve self-control of health behavior.

Wu et al. (2013) determined the resilience and coping styles 1743 students in a study in China. Multiple regression analysis indicated that the resilience and coping styles had a significant correlation.²⁵ Van der Hallen et al. (2020) reported that there was a strong and positive correlation between resilience and problem-solving methods. As shown, most of the studies had a relative consistency with the results of the present study.²⁶

According to this study's results, the resilient EMS personnel could organize responsibilities and daily tasks which were more capable than others of adapting to job changes, and could create and expand a set of coping skills, such as problem-solving skills in stressful situations. Based on the results, their higher creativity and tendency to solve problems improved their resilience, and higher self-compassion led to effective self-control in them. It is suggested training all four variables, namely resilience, self-compassion, self-control, and problem-solving styles, strengthens them in the personnel; hence, future studies can provide a complete and comprehensive regression model of the relationships among these psychological variables.

6. Conclusion

According to this study's results, the resilient EMS personnel could organize responsibilities and daily tasks which were more capable than others of adapting to job changes, and could create and expand a set of coping skills, such as problem-solving skills in stressful situations. Based on the results, their higher creativity and tendency to solve problems improved their resilience, and higher self-compassion led to effective self-control in them. It is suggested that training all four variables, namely resilience, self-compassion, self-control, and problem-solving styles, strengthens them in the personnel; hence, future studies can provide a complete and comprehensive regression model of the relationships among these psychological variables.

Research Highlights

What Is Already Known?

One of the important sources of problems for pre-hospital emergency workers is the stressful environment in which they work. In this context, there was no complete information about the correlation of some psychological variables.

What Does This Study Add?

Appropriate psychological measures and strategies are very important for employees who work in a stressful environment.

Author Contributions

RA contributed as the main author with the concept of planning the study. ZG and MGA contributed to study design, personnel selection, and data collection. MK and MNE performed the statistical analysis and helped write the manuscript. RA and MNE mentored the edition of the final version. All authors read and approved the final manuscript.

Conflict of Interest Disclosures

All authors declared that they have no conflict of interest.

Ethical Approval

The current study was approved by the Isfahan University of Medical Sciences Ethics Committee with the code of IR.MUI.MED.REC.1398.522. Written consent was obtained from the families of patients to enter this study.

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