

## Stress and Work Performance among Scientists and Technologists after Wenchuan Earthquake: the Moderating Role of Self-efficacy

Limei Ou, Fengchun Fan<sup>a,\*</sup>, Tian Zhang, Lindan Tan, Ling Yuan

School of Public Administration, Sichuan University, Chengdu 610065, China

<sup>a</sup>f85418325@163.com

\*Corresponding author

**Keywords:** Wenchuan Earthquake, Scientists and Technologists, Stress, Self-efficacy, Work Performance

**Abstract:** The present article examined the extent of self-efficacy moderate stress and work performance among scientists and technologists after the 2008 Wenchuan Earthquake in China. Self-report psychological questionnaires, the Maslach Burnout Inventory (MBI) and the General Self-Efficacy Scale (GSES) were used to interview a total of 704 survivors from the very hardest hit zone and the hardest hit zone. Results, based on a regression analysis, revealed that males and minorities were found to have a higher level of self-efficacy; Youngers have a better work performance; self-efficacy plays a partial moderation between stress and work performance. Overall, this analysis highlighted the significance of enhancing appropriate and effective self-efficacy strategies to increase work performance of scientific and technological workers after the earthquake. It also indicates that more energy needs to be devoted to stress-reducing and positive-incentive countermeasures, as well as active coping mechanisms and support from family and society, are protective factors for scientists and technologist survivors to increase self-efficacy and in turns to improve work performance.

### 1. Introduction

Natural disasters, especially earthquakes, occur un-expectedly [1]. The earthquake ever recorded struck Wenchuan (Sichuan, China) on May 12, 2008, was possibly the largest and most destructive recent earthquake as far as the geo-hazards are concerned [2]. Studies have shown that disasters can seriously affect the work performance of survivors [3]. It has been reported that survivors who lost relatives in the earthquake always suffered increased psychological stress [4]. Some researchers noted that individuals would be motivated to work if the stress was maintained at an appropriate level, as some considered that natural disasters may harmful to performance [5].

Stress refers to an individual's response pattern to external stress through the interaction of emotion, cognition, and physiology [6]. Work stress mainly comes from four aspects: the degree of work autonomy, work conflict, work restriction, and perception of fairness [7]. Work stress may occur when work demands exceed the resources available to the individual [8] especially when stress was on account of workers' perceived responsibility instead of job dissatisfaction or pressure [9]. Work pressure may harmful to individuals and organizations [10], and individuals will invest more time and energy to cope with the pressure, or even avoid work, resulting in low-performance [11]. Therefore, a suitable and safe approach that might relieve work strain effectively is necessary, especially for individuals who live in uncertainty and more risk environments. Furthermore, those people may achieve optimal performance both in terms of individual and organization.

Self-efficacy is an individuals' belief that he is capable of producing a particular activity successfully [12]. This "can-do" cognition represents a sense of self-confident of one's capability to produce designated levels of performance under various stressors in circumstances [13]. Self-efficacy has been seen to be a potential moderator between support-stress relationships, indicating that low levels of the self-efficacy could be compensated by higher levels of family

support [10]. Study has indicated that self-efficacy of managers may enhance the team performance [14]. Individuals with higher-level self-efficacy reflected better mental health and effective coping after earthquakes and other collective traumatic events [15].

Based on this association between stress, self-efficacy, and work performance, it was hypothesized that (1) stress has an effect on the scientists and technologists' work performance after the earthquake; (2) self-efficacy is an important factor for increasing work performance and operates as a moderating role between stress and work performance.

To test these hypotheses, researchers surveyed the survivors one year after the disaster. The participants were all selected from the worst affected earthquake areas in China's Sichuan province. According to official statistics from China's Ministry of Civil Affairs, the Richter magnitude 8 earthquake, killed 69,227 residents, left 4.8 million homeless and affected more than 15 million surrounding provinces. It was considered to be one of the worst disasters from the founding of the People's Republic of China. It was reported that the survivors obtained extremely low-stress index in the stress assessment, which provided a feasible research basis for the implementation of this study. The purpose of this study was to understand the correlation between post-earthquake survivors' stress and work performance, as well as the moderating effect of self-efficacy.

## **2. Methods**

### **2.1 Sample and procedure**

We conducted a cross-sectional survey of 704 participants from May to September 2009 in the very hardest hit zone (Beichuan, Wenchuan and Shifang) and the hardest hit zone (Jiange, Hanyuan and Songpan) as the survey area from the 20 hardest-hit counties. Meanwhile, scientists and technologists who living in the earthquake-affected areas and experienced the earthquake were selected as the questionnaire survey participants. At the same time, the use of knowledge from management science, statistics, organizational behavior, psychology and sociology which combine with research methods including a literature analysis, a mathematical and statistical analysis which take the stress, self-efficacy and work performance as the core to analyze and research. A total of 800 survey questionnaires were extended, 746 questionnaires were returned and 704 valid questionnaires were finally collected, the effective rate was 88%.

### **2.2 Demographic characteristics**

Basic demographic characteristics included age, gender, education level, monthly income and ethnicity. Age was divided into three groups: <30 (coded as 1), 31-55 (coded as 2), and >55 (coded as 3). Gender was coded as 1 (male) and 2 (female). Education status was coded as 1(no degree), 2 (bachelor level) and 3 (Masters Level). Three monthly income levels were coded as 1=<1, 000 Yuan, 2= from 1,000 to 2, 000 Yuan, 3= more than 2, 000 Yuan. Ethnicity was coded as 1 (Han), 2 (Tibetan), 3 (Hui), 4 (Qiang) and 5 (Others).

### **2.3 Instruments**

#### **Stress**

Work stress can be defined as an emotional response or response. This stress occurs when the requirements of the job create a physiological, resources and need mismatch for the worker (National Institute of Occupational Safety and Health 1999). There are a variety of work stress sources for earthquake survivors in this study, for instance, work time, work strength, work responsibility, role conflict, life and property security, inadequate resources, job promotion, and inconvenient traffic, etc. Stress is measured using the Maslach Burnout Inventory (MBI) [16]. In this research, 20 adjusted questions and an open question based on MBI was used for the scientists and technologists after Wenchuan earthquake. The two-week test-retest reliability of the self-efficacy exceeded 0.86.

#### **Work performance**

Work performance is often defined as the total expected value of a social individual to an organization over a given period time [17]. This was assessed using the work performance measurement scale, which includes 12 items measuring the three work performance domains (work performance self-evaluation, degree of work completion and work schedule). A higher score indicates better job performance. The corresponding values of the three main performance factors of the scale are 0.69, 0.71 and 0.84 respectively, therefore the internal consistency is high.

### Self-efficacy

Bandura first came up with the concept of self-efficacy. This concept holds that an individual who can produce the desired effect will produce more active and self-determined behavior [18]. Self-efficacy has been measured by the General Self-Efficacy Scale (GSES). In this self-test Likert scale, there are 20 items. In this study, a total of 13 items were used to measure the actual situation of scientific and technological workers in the disaster area [18]. Each item contains 5-points (rated 1= not at all, 2= slightly, 3= moderately, 4= severely, 5= extremely) levels of measurement. The two-week test-retest reliability of the self-efficacy exceeded 0.78.

## 2.4 Statistical analysis

In the data analysis of this study, the descriptive characteristics of samples are calculated and presented, including the mean value, standard deviation, and range of variables. Pearson correlation analysis was also used to examine the relationship between job stress, job performance, and self-efficacy. The three-step composite analysis method is used to examine the correlation. A P-value of 0.05 is considered statistically significant. In this study, SPSS16.0 Statistical Package for social science was used to analyze all the data.

## 3. Results

### 3.1 Survey responses

Table 1 shows the demographic characteristics of this research sample. The 704 samples were aged from 30 to 55 when they were interviewed. The majority of them were male, standing at 56.1% of the samples. 57% of the overall sample had a low level of education. Among them, the Han ethnic group is the majority, accounting for 70.2% of the sample review, while the proportions of other ethnic groups are respectively Tibetan (7.2%), Qiang (19%), Hui (3%), and others (like Tujia and Yi., 0.6%). In terms of personal income, 83.4% of the total individuals earn less than 2,000 Yuan per month.

Table 1. Sociodemographic characteristics of the study sample (N=704).

|                       | <i>N</i> | %    |                         | <i>N</i> | %    |
|-----------------------|----------|------|-------------------------|----------|------|
| <b>Gender</b>         |          |      | <b>Ethnic group</b>     |          |      |
| Male                  | 395      | 56.1 | Han                     | 494      | 70.2 |
| Female                | 309      | 43.9 | Qiang                   | 134      | 19   |
| <b>Age groups</b>     |          |      | Tibetan                 | 51       | 7.2  |
| < 30                  | 233      | 33.1 | Hui                     | 21       | 3    |
| 31-55                 | 348      | 49.4 | Others                  | 4        | 0.6  |
| > 55                  | 123      | 17.5 |                         |          |      |
| <b>Income monthly</b> |          |      | <b>Education degree</b> |          |      |
| <1000 Yuan            | 197      | 28   | Master                  | 12       | 1.7  |
| 1000-2000 Yuan        | 390      | 55.4 | Bachelor                | 290      | 41.2 |
| >2000 Yuan            | 117      | 16.6 | No degree               | 402      | 57.1 |

Table 2 shows the scores between stress, self-efficacy, and work performance, grouped by demographic variables. There were significant differences among age groups, with the highest stress scores for subgroups ranging in age from 31 to 55. Those under 31 had higher levels of stress than those over 55 and had lower self-efficacy scores. In terms of gender, the difference in stress was

significant. Female samples had higher pressure than male samples, but female samples had lower self-efficacy scores than male ones. There was no significant difference in work performance between different genders. There were significant differences in stress and self-efficacy among subgroups of different ethnics. Among all ethnic groups, the Han ethnic group had the highest stress number and the lowest self-efficacy score.

Table 2. Scores of stress, self-efficacy and work performance on socio-demographic variables (N=704)

| variables    | Stress     |                 | Self-efficacy |                 | Work Performance |                 |
|--------------|------------|-----------------|---------------|-----------------|------------------|-----------------|
|              | Mean (SD)  | <i>p</i> -value | Mean(SD)      | <i>p</i> -value | Mean(SD)         | <i>p</i> -value |
| Age          |            |                 |               |                 |                  |                 |
| <30          | 3.24(0.15) | **              | 3.42(0.41)    | *               | 4.25(0.28)       | **              |
| 31-55        | 3.46(0.28) |                 | 3.45(0.4)     |                 | 4.19(0.28)       |                 |
| >55          | 3.22(0.31) |                 | 3.46(0.4)     |                 | 0.28(8.02)       |                 |
| Sex          |            |                 |               |                 |                  |                 |
| Male         | 3.04(0.25) | **              | 3.06(0.043)   | *               | 4.12(0.28)       | 0.042           |
| Female       | 3.43(0.17) |                 | 2.87(0.06)    |                 | 4.12(0.28)       |                 |
| Ethnic group |            |                 |               |                 |                  |                 |
| Han          | 3.64(0.15) | **              | 3.13(0.41)    | *               | 4.05(0.28)       | 8.073           |
| Tibetan      | 3.16(0.18) |                 | 3.43(0.42)    |                 | 4.09(0.24)       |                 |
| Qiang        | 3.46(0.28) |                 | 3.47(0.40)    |                 | 4.13(0.28)       |                 |
| Hui          | 3.21(0.31) |                 | 3.46(0.40)    |                 | 4.15(0.28)       |                 |

\* $P < 0.05$ ; \*\* $P < 0.01$ ; \*\*\* $P < 0.001$ .

### 3.2 Correlation analysis

The Pearson Chi-Square and correlations of stress, work performance, and self-efficacy are shown in Table 3. Stress and self-efficacy were found to be highly related to work performance. For the correlation between stress and self-efficacy, the Pearson Chi-Square was 9.819<sup>a</sup>, and the correlation between stress and work performance, the Pearson Chi-Square was 9.178<sup>a</sup>. Self-efficacy and work performance was positively correlated.

Table 3. Pearson Correlations for the total sample

|                  |                     | Stress  | Self-efficacy | Work Performance |
|------------------|---------------------|---------|---------------|------------------|
| Stress           | Pearson Correlation | 1       | 9.819**       | 9.178**          |
|                  | Sig (2-tailed)      |         | 0.002         | 0.005            |
|                  | N                   | 704     | 704           | 704              |
| Self-efficacy    | Pearson Correlation | 9.819** | 1             | 8.732**          |
|                  | Sig (2-tailed)      | 0.002   |               | 0.002            |
|                  | N                   | 704     | 704           | 704              |
| Work Performance | Pearson Correlation | 9.178** | 8.732**       | 1                |
|                  | Sig (2-tailed)      | 0.005   | 0.002         |                  |
|                  | N                   | 704     | 704           | 704              |

\* $p < 0.05$ , \*\* $p < 0.01$ .

### 3.3 Moderation analysis

Results indicated that self-efficacy may moderate the effects of stress on work performance based on of a three-step regression testing (see Table 4). The notations represent the standardized variable for the corresponding variables ( $X$  represents the effect of stress,  $X_1 - X_9$  represents different stressors,  $Y$  represents the effect of Work Performance,  $M$  represents the effect of Self-efficacy). Self-efficacy has a significant moderating effect on the influence of working strength stress, working

responsibility stress, role conflict stress and job promotion stress on performance, and conclusion can be obtained that self-efficacy assumes a partial moderator between stress and work performance.

Table. 4 Successive testing of moderating effects for self-efficacy

| Variables   | Performance (Y)   |         |                |        |          |       |           |        |
|---|---|---------|----------------|--------|----------|-------|-----------|--------|
|   | Standardized regression equation                                      | F       | R <sup>2</sup> | SE     | Beta     | t     |           |        |
| Step 1 Stress                                       | $Y = -0.211X_1 - 0.117X_2 + 0.152X_3 - 0.317X_4 - 0.036X_6 + 0.08X_7$ | 3.653** | 0.044          |        |          |       |           |        |
| Stress (X)  |   |         |                |        |          |       |           |        |
| Working time stress (X <sub>1</sub> )               |   |         |                |        |          | 0.045 | -0.211*** | 8.801  |
| Working strength stress (X <sub>2</sub> )           |   |         |                |        |          | 0.095 | -0.117**  | 4.15   |
| Working responsibility stress (X <sub>3</sub> )     |   |         |                |        |          | 0.168 | 0.152***  | -5.525 |
| Role conflict stress (X <sub>4</sub> )              |   |         |                |        |          | 0.033 | -0.317*** | 13.229 |
| Life and property security stress (X <sub>5</sub> ) |   |         |                |        |          | 0.069 | 0.007     | 0.237  |
| Inadequate resources stress (X <sub>6</sub> )       |   |         |                |        |          | 0.121 | -0.036**  | -1.312 |
| Job Promotion stress (X <sub>7</sub> )              |   |         |                |        |          | 0.151 | 0.08***   | -3.855 |
| Inconvenient traffic stress (X <sub>8</sub> )       |   |         |                |        |          | 0.225 | -0.051    | -2.347 |
| Others (X <sub>9</sub> )                            |   |         | 0.204          | -0.093 | 3.773    |       |           |        |
| Step 2  | $Y = 0.537M$  | 6.831   | 0.146          |        |          |       |           |        |
| Self-efficacy (M)                                   |   |         |                | 0.440  | 0.537**  | 9.401 |           |        |
| Step 3  | $Y = -0.155X_2M + 0.046X_3M - 0.127X_4M - 0.086X_7M$                  |         |                |        |          |       |           |        |
| X <sub>1</sub> × M                                  |   |         |                | 0.012  | 0.627    | 37.85 |           |        |
| X <sub>2</sub> × M                                  |   |         |                | 0.023  | -0.155** | 9.364 |           |        |
| X <sub>3</sub> × M                                  |   |         |                | 0.004  | 0.046*   | 2.118 |           |        |
| X <sub>4</sub> × M                                  |   |         |                | 0.026  | -0.127** | 37.85 |           |        |
| X <sub>6</sub> × M                                  |   |         |                | 0.127  | -0.215   | 9.364 |           |        |
| X <sub>7</sub> × M                                  |   |         |                | 0.504  | -0.086*  | 2.118 |           |        |

SE standard deviation \* $p < 0.05$ , \*\* $p < 0.01$ .

#### 4. Discussion

Stress is one of the most significant variables which have essential effects on the work performance of survivors after a disaster [19, 20]. The research aims to investigate the moderating effect of self-efficacy on stress and work performance among scientists and technologists after the Wenchuan earthquake. There is a positive relationship between stress and work performance according to the correlation analysis, the finding is in line with previous research linking that if individual stress is kept at an appropriate level, it can stimulate individual work motivation [21]. The

correlation analysis also showed self-efficacy was positively correlated with stress and work performance. The results partially support hypothesis 1 and confirm hypothesis 2. This study showed that gender difference existed in scientists and technologists' stress, and there was a greater level of pressure on females than males, however, no significant difference in work performance was found between them. As in previous researches, females may experience more stress both physical and psychological than males following disastrous events [22, 23] and they are more vulnerable than males [24]. One possible explanation is in the differences in the degree of role conflict after the disaster, with females facing more anxiety and fear about career and family, especially some of them had lost family members in the disaster.

Age levels were found to be a crucial factor in scientists and technologists' stress, work performance and self-efficacy. One reason is that the participants aged between 31-35 faced with more anxiety and fear of rebuilding home as they were always the cornerstone of families, another reason is that primary and secondary school students were a large group of the victims in the earthquake, and their parents always happened to be at the age of 31-35 which aggravated pressure. As the work performance is often associated with abundant energy, the younger showed higher scores for task performance than others, which indicated that young people may have a positive effect on work performance. Previous researches have proved that young people are more likely to achieve performance goals, as Pincherle studied on the different age groups of cases, the results have proved that young people are more positive on stress feedback [25].

Results indicate a positive relationship between stress and work performance after the devastating earthquake. This was in accordance with previous research where stress can improve individual performance to some extent, from the studies of Pasha, the event itself can further stimulate the individual's stress response and thus stimulate the individual's potential [26]. One possible explanation is that individuals with proper pressure can better enhance subjective initiative and self-stimulation. From direct and indirect interviews, it was discovered that because the survivors devoted more energy to the post-disaster reconstruction which supported by the government, most expressed a positive attitude and confidence towards the future.

Previous research indicated self-efficacy (as a defense mechanism) was a protective factor in stressful situations [27]. In this study, self-efficacy had a positive correlation with work performance. The results from correlation analysis showed that self-efficacy was found to be a significant factor for scientists and technologists' work performance, which is consistent with previous research [28, 29]. Individuals with self-efficacy are more likely to succeed in overcoming unpleasant experiences [30], and can enhance their self-esteem by mounting a successful opposition to any negative feelings about the disaster [31], which promotes them to accomplish a working target in turns.

Besides, it was also demonstrated from this study that there might be a moderating effect of self-efficacy between stress and work performance, which highlighted the considerable importance of enhancing self-efficacy for earthquake survivors. According to the analysis of this study, a partial moderating function was proved and therefore there might be other potential moderating variables contributing to the relationship between stress and work performance. Based on the results of this study and previous researches, the emphasis on improving self-efficacy for earthquake survivors was summarized. Firstly, different subjects including government, local community and volunteer organization need to enhance collaborative efforts in providing various social support and social services [32]. Secondly, building a multi-level organizational incentive mechanism and scientific individual stress assessment mechanism is meaningful at an organizational level. Thirdly, strong support and love and caring and concern that individuals get from families or friends who are conducive to improve their self-efficacy, especially when they are vulnerable both mentally and physically after a devastating disaster. At last, the scientific and technological workers themselves should improve the ability of emotional adjustment to adapt to the new circumstances after the great catastrophe. Furthermore, scientific and technological workers who are females or aged between 31-55 may require more care and assistance from society.

## 5. Conclusion

Although there are some restrictions, this analysis revealed that self-efficacy had a partial moderating effect between stress and work performance, which highlights the significance of enhancing appropriate and effective self-efficacy strategies to increase the work performance of scientific and technological workers after the earthquake.

## Acknowledgements

This research was supported by the Major Research Projects of the National Social Science Foundation of China (Grant No. 17VZL007).

## References

- [1] Kowalski, K.M., Kalayjian, A. 2001. Responding to mass emotional trauma: A mental health outreach program for Turkey earthquake victims. *Safety Science*, 39(1-2): 71-81.
- [2] Fan, Xuanmei, Juang, C.Hsein, WASOWSKI, Janusz et al. 2018. What we have learned from the 2008 Wenchuan Earthquake and its aftermath: A decade of research and challenges. *Engineering Geology*, 241: 25-32.
- [3] McKibben, Jodi B. A., Fullerton, Carol S., Ursano, Robert J., ET al.2010. Sleep and Arousal as Risk Factors for Adverse Health and Work Performance in Public Health Workers Involved in the 2004 Florida Hurricane Season. *Disaster Medicine and Public Health Preparedness*, 4(S1): S55-S62.
- [4] Marthoenis, Marthoenis; Nirwana, Andri; Fathiariani, Liza. 2019. Prevalence and determinants of posttraumatic stress in adolescents following an earthquake. *Indian Journal of Psychiatry*, 61(5): 526.
- [5] Helton, W. S., Head, J. 2012. Earthquakes on the Mind: Implications of Disasters for Human Performance. *Human Factors*, 54(2): 189-194.
- [6] Greenberg, J. & Baron R. A. Behavior in organization, Englewood Cliff, New Jersey: Prentice-Hall. Gronroos, C, 1995.
- [7] Suzy Fox.2001. Counterproductive working behavior (CWB) in response to job stressors and organizational justice: some mediator and moderator tests for autonomy and emotions [J]. *Journal of Vocational Behavior*, 59: 291-309.
- [8] Robert A. Karasek, Jr. 1979. Job demands, job decision latitude and mental strain: implications for job redesign [J]. *Administrative Science Quarterly*, 24(2):285-308.
- [9] Park J. 2007. Work stress and job performance [M]. Ottawa, Canada: Statistics Canada.
- [10] Jamal, M. 1984. Job stress and job performance controversy: an empirical assessment [J]. *Organizational Behavior and Human Performance*, 33:1-21.
- [11] Allen DR, Hitt M, Greer CR. 1982. Occupational stress and perceived organizational effectiveness in formal groups: an examination of stress level and stress type [J]. *Personnel Psychology*, 35: 359-371.
- [12] Albert Bandura. 1995. Self-Efficacy in Changing Societies [M]. Cambridge University Press.
- [13] Warner, L. M., Gutiérrez-Doña, B., Villegas Angulo, M., & Schwarzer, R. 2015. Resource loss, self-efficacy, and family support predict posttraumatic stress symptoms: a 3-year study of earthquake survivors. *Anxiety, Stress, & Coping*, 28(3), 239-253.

- [14] Laschruger. H. K.S., Shamian. J. 1994. Staff nurses and nurses' managers' perceptions of job-related empowerment and managerial self-efficacy [J]. *Journal of Nursing Administration*, 24: 38-47.
- [15] Liang, B., & Su, C. 2011. A study on relationship among general self-efficacy, coping styles and mental health of freshmen from Sichuan earthquake-stricken areas. *Chinese Journal of Clinical Psychology*, 19(5), 669–671.
- [16] Gil-Monte P R. 2005. Factorial validity of the Maslach Burnout Inventory (MBI-HSS) among Spanish professionals [J]. *Revista de saúde pública*, 39: 1-8.
- [17] Motowidlo S J, Kell H J. 2012. Job performance [J]. *Handbook of Psychology, Second Edition*.
- [18] Schwarzer R, Scholz U. 2000. Cross-cultural assessment of coping resources: The general perceived self-efficacy scale[C]//First Asian Congress of Health Psychology: Health Psychology and Culture, Tokyo, Japan.
- [19] Yule W, Bolton D, Udwin O, et al. 2000. The long-term psychological effects of a disaster experienced in adolescence: I: The incidence and course of PTSD [J]. *The Journal of Child Psychology and Psychiatry and Allied Disciplines*, 41(4): 503-511.
- [20] Paton D, Flin R. 1999. Disaster stress: an emergency management perspective [J]. *Disaster Prevention and Management: An International Journal*, 8(4): 261-267.
- [21] Scott Jr, W. E. 1966. Activation theory and task design [J]. *Organizational behavior and human performance*, 1(1), 3-30.
- [22] Zongtang Xie, Jiuping Xu\*, Zhibin Wu. 2017. Mental health problems among survivors in hard-hit areas of the 5.12 Wenchuan and 4.20 Lushan earthquakes [J]. *Journal of Mental Health*, 26(1): 43-49.
- [23] Zhang Z, Shi Z, Wang L, Liu M. 2011. One year later: Mental health problems among survivors in hard hit areas of the Wenchuan earthquake. *Public Health*, 125(5): 293-300.
- [24] Ehring T, Razik S, Emmelkamp P. 2011. Prevalence and predictors of posttraumatic stress disorder, anxiety, depression, and burnout in Pakistani earthquake recovery workers. *Psychiatry research*, 185(1-2): 161-166.
- [25] Pincherle, G. 1972. Fitness for Work: Assessment of the Relationship between Stress and Work Performance, 321-324.
- [26] Kerai, Salima, et al. 2016. 90 Association of post-traumatic stress disorder with work performance amongst emergency medical service personnel, Karachi, Pakistan. A34-A34.
- [27] Min Li, Jiuping Xu, Yuan He, Zhibin Wu. 2012. The analysis of the resilience of adults one year after the 2008 Wenchuan earthquake [J]. *Journal of Community Psychology*, 40 (7): 860-870.
- [28] Brown S P, Jones E, Leigh T W. 2005. The attenuating effect of role overload on relationships linking self-efficacy and goal level to work performance. *Journal of Applied Psychology*, 90(5): 972.
- [29] Judge T A, Jackson C L, Shaw J C, et al. 2007. Self-efficacy and work-related performance: The integral role of individual differences [J]. *Journal of applied psychology*, 92(1): 107.
- [30] Tugade MM, Fredrickson BL. 2004. Resilient individuals use positive emotion to bounce back from negative emotional experiences [J]. *Journal of personality and social psychology*, 86(2): 320.
- [31] Benetti C, Kambouropoulos N. 2006. Affect-regulated indirect effects of trait anxiety and trait resilience on self-esteem [J]. *Personality and individual differences*, 41(2): 341-352.
- [32] Jiuping Xu, Limei Ou. 2014. Resilience and quality of life among Wenchuan earthquake survivors: the mediating role of social support [J]. *Public Health*, 128(5): 430-437.