

## Study of the Correlation between Posttraumatic Growth with the Quality of Life of the Spinal Cord Injury Patients

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Posttraumatic growth is a positive psychological change which is induced by traumatic incident as a result of the struggle of the individual against this stressful incident. Current study was performed to assess the correlation between posttraumatic growth after incident and the quality of life in spinal cord injury patients. This was a descriptive-correlational study conducted on 95 of the spinal cord injury patients. The participants were selected from the members of the spinal cord injury association of Tehran province (Iran) using a simple random selection method. Different aspects of the quality of life and condition of posttraumatic growth of the subjects were investigated using the standard questionnaires of Ferrans and Powers quality of life index spinal cord injury and posttraumatic growth scale, respectively. The data were analyzed with statistical package SPSS (version 16) using descriptive-analytical statistical tests. Based on the findings, 41.1 percent of the subjects were in the age range of 33-42 years and 64.2 and 35.8 percent were men and women, respectively. In the majority of the subjects (42.1 percent), 2-12 years had passed since their injury and 89.5 percent of the subjects were paraplegic. In 48.4 percent of individuals the reason of injury was car crash, 15.8 percent was fall from heights, 29.5 percent was Iran-Iraq war, and in 6.3 percent of participants the cause of their injury was due to illness or a congenital problem. Mean of the total score for the quality of life was obtained to be  $77.39 \pm 11.61$ , mean score for the dimension of the satisfaction with life and the importance of life dimension were obtained to be  $78.26 \pm 11.36$  and  $70.81 \pm 82.17$ , respectively. Pearson correlation coefficient statistical test with  $p=0.00$  and  $r=0.628$ , showed a significant and direct relation between the score of the quality of the life of spinal cord injuries patients and posttraumatic growth. In current research a significant and direct relationship between posttraumatic growth and the quality of life of individuals with spinal cord injury was observed, and also the effects of traumatic events, including spinal cord injuries, show the coping efforts of people can lead to the interpretation of the disease with positive effects and that spiritual change in patients is high that causes increase in growth rate after incident and improvement in the quality of life of spinal cord injuries patients.

**Key words:** Quality of life, posttraumatic growth, spinal cord injury.

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Each year many people experience damage in spinal cord and spinal column area, following accidents due to car crashes, fall from heights, and diseases of spines, spinal cord and

neck, in the meantime some of them get some degree of spinal cord injury or paralyzed limbs, which the complications of these injuries remain with them until the end of their lives<sup>1</sup>. In the beginning, the individual with spinal cord injury faces the reality that he/she has lost all or part of his abilities and with not having a clear image of himself and what will be waiting for him, develops anxiety; in other

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words, spinal cord injury effects different aspects of life and the individual develops psychological, personality, and spiritual crises<sup>2</sup>.

It is more than a decade that the study of the quality of life has been raised as an important subject in special healthcare in chronic diseases and disorders<sup>3</sup> and the quality of life of these patients is of great interest<sup>4</sup>. Quality of life is a complex issue and providing clear guidelines to improve the quality of life is a difficult task; but perhaps one way of improving the quality of life is to help people so that they can bring their potential into action; quality of life is the best criteria to measure the ability of an individual to cope with existing challenges<sup>5</sup> and is deemed to be a reflection of the ability of individuals for coping and compatibility with new situations<sup>6</sup>.

It seems unpleasant life events such as getting serious illnesses like spinal cord injuries can cause negative reactions such as anxiety and depression in patients; despite this, many patients who live with these disorders have reported desirable quality of life, positive changes, and growth<sup>7</sup>. This growth is a significant experience of positive changes due to stressful and negative life events<sup>8</sup>, which these positive changes are called "posttraumatic growth"; Tedeschi and Calhoun where the first researchers who performed studies in this field, when the changes due to an accident or a trauma lead to a deeper understanding of the person from this world or himself, posttraumatic growth happens and it seems these changes occur through struggle with the trauma that the individual has encountered, and includes five dimensions of new situations, relationship with others, valuing the life, personal power, and spiritual changes<sup>9</sup>.

Posttraumatic growth is in fact the cornerstone of crisis theory and the assumption is that crises create opportunities for growth and development of individuals<sup>8</sup>. Positive changes with regard to a stressful trauma are one of the usual factors for fighting with difficulties and the existence of these changes can be a move forward for people to improve their performance compared to before the creation of the stressful event<sup>9</sup>. Adaptation of individuals with a stressful and negative incident is often an indication that they have become more powerful and have become confident that in future they can encounter different accidents and hardships and can confront

them<sup>10</sup>. It seems that post-trauma growth creates a relationship between the stress caused by the accident and maintaining psychological health and quality of life. Traumatic stress causes depression and reduction in the quality of life but the more powerful the posttraumatic growth is, the weaker the stress caused by the incident is and the higher the quality of the life of people is<sup>11</sup>.

Understanding the concept of posttraumatic growth and its aspects in patients with spinal cord injuries provides information to healthcare providers so they can assist patients in caring and help them cope with their stressful situations; this better coping will improve the quality of life of these patients. Since in Iran, a study regarding the relationship between posttraumatic growth and its aspects and the quality of life in patients with spinal cord injuries has not been done, this study was carried out with the aim to study the correlation between the posttraumatic growth and the quality of life of patients with traumatic spinal cord injuries.

## MATERIALS AND METHODS

This was a descriptive-correlational study conducted on 95 of the spinal cord injury patients. The participants were selected from the members of the spinal cord injury association of Tehran province (Iran) using a simple random selection method during November to December 2014. The patients with the inclusion criteria were selected and assigned a number. Then, using the table of random numbers a random number was generated and then the individuals were selected and assessed according to the considered number. The number of samples was determined considering an error of 0.05 and  $Z\alpha=1.64$

The samples were 95 patients who were admitted to the Tehran spinal cord injuries association, who were older than 18 years of age, at least six months had passed since the accident led to their spinal cord injury, and had some kind of spinal cord injury caused by falling from heights, car accident, war, congenital diseases or an illness. Tools used in this research included demographic information questionnaire, quality of life index of spinal cord injury (Ferrans & Powers, 1998), and posttraumatic growth scale (Tedeschi and Calhoun, 1996).

Demographic information questionnaire included 14 questions regarding age, sex, marital status, level of education, occupation, economic status, time elapsed since the injury, place of injury (in neck or waist), cause of injury (car accident, fall, war), type of insurance, background illness, and religion, which was filled in by samples.

#### **Quality of Life Index Spinal Cord Injury**

“Quality of life index of spinal cord injury patients’ questionnaire” was designed by Ferrans and Powers to assess the quality of life of individuals with spinal cord injuries in 1998. This questionnaire has two dimensions (importance and satisfaction) that each dimension has 37 statements and assesses four areas of the quality of life of spinal cord injury patients including “health and performance status”, “Family”, “spiritual and psychological area”, and “economic and social area”. Scoring of this tool is based on 6-point Likert scale. The total score range of this questionnaire was 74 to 444. Validity and reliability of the tool was performed by the researcher. For this purpose, in this study the content validity method was used to determine the validity of the questionnaire of the “Quality of Life Index Quality of life index spinal cord injury”; after getting permission from the designer of the questionnaire, it was translated. After translating the tool, the researcher gave the questionnaire to ten relevant specialists along with necessary explanations and they were asked to determine the validity of the content, degree of relevance, clarity, and simplicity of each of existing statements in the tool based on the index. After collecting the views of the professors, necessary changes were applied to the questionnaire and to assess the final questionnaire the method of internal consistency assessment by calculation of Cronbach’s alpha coefficient was used in each dimension. Cronbach’s alpha coefficients for two dimensions of degree of satisfaction and degree of importance were 0.89 and 0.98 respectively and for quality of life total score was 0.980. Consistencies of the questionnaire by test re-test method for a ten day period for two dimensions of degree of satisfaction and degree of importance were respectively 0.999 and 0.998.

In this research, posttrauma growth of participants was evaluated using “postraumatic growth scale”. This scale has been designed by Tedeschi and Calhoun (1996) and has 21 statements

and determines five areas of the degree of psychological growth after confronting a stressful trauma (new opportunities, relation with others, valuing the life, personal power and spiritual changes). This tool is based on 6-point Likert scale and its score domain is from zero to 105. In Iran, this scale was translated and validated by Haydarzadeh *et al.* (2014). In this research, the Cronbach’s alpha coefficient of the tools was reported as 0.90.

The researcher went to spinal cord injuries association with prior coordination and with identifying himself and presenting permission to the authorities of the association of spinal cord injuries and after getting permission from them to collect the data, attended the location of the research between 8 a.m. to 3 p.m. from Saturday to Wednesday. After matching the samples under study with the specifications of the research unit, the samples were selected and the researcher, after introducing himself to each one of samples, explained the goal of the research and the method of performing it to them, and obtained the informed consent of the samples to participate in the research. Researcher was present when samples filled in the questionnaire and in case they needed guidance gave them the necessary help, then questionnaires were completed by each one of samples. The collected data were analyzed by descriptive and analytical statistical methods (independent T, one-way analysis of variance, and Pearson correlation coefficient test) and by using the statistical software SPSS16.

## **RESULTS**

Demographic characteristics of the samples are shown in Table 1. Mean of the total scores of the quality of life and its dimensions including satisfaction with life and importance of life dimensions are shown in Table 2. In addition, the scores of the posttraumatic growth with all of its dimensions are shown in Table 3. The area of “relation with others” and the area of “spiritual changes” with a degree close to each other have the highest amount of the score of the posttraumatic growth (Table 3).

Pearson correlation coefficient showed a significant and direct correlation between the score of the quality of life of spinal cord injuries patients

**Table 1.** Demographic specifications of the member patients of Tehran province spinal cord injuries association 1993

Variable	Categories	Numbers	Percentage	Variable	Categories	Numbers	Percentage
Sex	Female	34	35.8	Marital status	Single	22	23.3
	male	61	64.2		Married	64	67.4
Age	19 - 21	19	20	Employment status	Widowed	3	3.2
	22 - 32	29	30.5		Divorced	6	6.3
	33 - 43	39	41.1		Self-employed	22	23.2
	Over 44	8	8.5		Government employee	17	17.9
Place of injury	Paraplegia	85	89.5	Housewife	17	17.9	
				Unemployed	16	16.8	
				Retired	4	4.2	
				Disabled	19	20	
				Primary school	9	9.5	
Cause of injury	Tetraplegia	7	7.4	Middle school	8	8.4	
	Hemiplegia	3	3.2	High school drop-out	16	16.8	
	Car accident	46	48.4	High school diploma	31	32.6	
	Fall	15	15.8	University degree	31	32.6	
	Iran-Iraq war	28	29.5	2 - 12	40	42.1	
Others	6	6.3	13 - 23	31	32.6		
			24 - 34	22	23.2		
			Over 34	2	2.1		

and posttraumatic growth and also there is a direct and significant correlation between quality of life dimensions, i.e. satisfaction with life and importance of life dimensions, and posttraumatic growth score ( $p < 0.001$ ) (Table 4); among posttraumatic growth dimensions, a significant relation between personal empowering dimension and the spiritual-psychological area of satisfaction of life dimension was observed, also there is a direct and significant correlation between all dimensions of the areas of the importance of life in research subjects and the relationship with others dimension from among posttraumatic growth dimensions (Table 4).

A significant relation between the mean score of posttraumatic growth score and mean score of the quality of life with demographic variables (sex, cause of injury, the time elapsed after injury, marital status) was observed, the

posttraumatic growth score and the quality of life that has been compared with sex using t-test, is significantly higher in men than women ( $p < 0.001$ ). The mean amounts of the posttraumatic growth dimensions and the quality of life in four groups of the cause of injury were compared using one-way variance analysis and then, using supplementary Tukey's test, the groups in each dimension were compared pairwise and it was found that posttraumatic growth score in individuals that the cause of their injury was due to "Iran-Iraq war" was significantly higher than individuals that the cause of their injury was due to other factors ( $P < 0.01$ ). The posttraumatic growth score in people that 13-23 years has elapsed since their injury is significantly higher than people that 2-12 years has passed since their injury ( $P$ .value = 0.003). In variance analysis results, no significant difference between posttraumatic growth score and the marital

**Table 2.** Mean and variance of the total score of the quality of life in spinal cord injury patients

Dimension	Minimum score	Maximum score	Mean	Variance
Satisfaction with life	23.33	97.14	66.19	15.79
Importance of life	37.14	100	88.60	11.36
Quality of life total score	37.14	98.57	77.39	11.61

**Table 3.** Mean and variance of posttraumatic grow score and its dimensions in spinal cord injuries patients

Dimension	Minimum score	Maximum score	Mean	Variance
New opportunities	8	100	64.12	21.66
Relation with others	28.57	100	75.51	16.17
Personal empowerment	15	100	69.63	22.39
Life appreciation	20	100	68.63	21.21
Spiritual changes	0	100	76.63	24.25
Posttraumatic growth total score	23.81	100	70.81	17.82

**Table 4.** Relationship between posttraumatic growth and quality of life using Pearson test

Dimensions	New opportunities	Relationship with others	Personal empowerment	Life appreciation	Spiritual changes total score	Posttraumatic growth
Satisfaction with life	* $p < 0.001$ $r = 0.603$	* $p < 0.001$ $r = 0.62$	* $p < 0.001$ $r = 0.59$	* $p < 0.001$ $r = 0.635$	* $p < 0.001$ $r = 0.359$	* $p < 0.001$ $r = 0.663$
Importance of life	$p = 0.003$ $r = 0.306$	$P < 0.000$ $r = 0.446$	** $p = 0.02$ $r = 0.231$	$p = 0.004$ $r = 0.296$	$p = 0.29$ $r = 0.224$	* $p < 0.001$ $r = 0.363$
Quality of life total score	$p < 0.001$ $r = 0.56$	$p < 0.001$ $r = 0.642$	$p < 0.001$ $r = 0.576$	$p < 0.001$ $r = 0.522$	$p < 0.001$ $r = 0.352$	$p < 0.001$ $r = 0.542$

status of the assessed case was observed but the quality of life score in married people was significantly higher than singles ( $p < 0.001$ ).

## DISCUSSION

This study was performed with the goal to investigate the correlation between posttraumatic growth and the quality of patients with spinal cord injuries, with regard to the amount posttraumatic growth, the results of the study showed that all patients with spinal cord injury who participated in the study have demonstrated some degree of growth and the mean posttraumatic growth among them has been  $17.82 \pm 70.81$ ; the highest percentage of earned scores in different dimensions were obtained for “spiritual changes”, “relation with others”, “personal empowerment”, and “new opportunities” dimensions respectively. The results of this study are in line with the research by Haydarzadeh *et al.* (2014), such that they stated the posttraumatic growth mean has been  $68.68 \pm 14.68$  and the highest percentage in different dimensions has respectively been for “spiritual changes”, “relationship with others”, “life appreciation”, “personal empowerment”, and “new opportunities”<sup>12</sup>. In the study of Morris *et al.* (2000), the highest posttraumatic growth in cancer patients in order of priority were “appreciation of life”, “relationship with others”, “personal empowerment”, “new opportunities”, and spirituality<sup>11</sup>.

In this study it was found that the “spiritual change” has achieved the highest score, this study showed that one of the most important factors that has helped patients cope with their illness, has been their religious view. Newman (1990) in describing the important psychological roles of religion in helping people to understand and cope with life events writes that religion can be effective in creating a sense of closeness to others, emotional calamity, self-actualization opportunity, a sense of comfort, intimacy with god, and help in solving the problem. Also spirituality and religion are important factors in coping with life stressors<sup>13</sup> so that spirituality and spiritual beliefs have a relationship with the sense of health<sup>14</sup>. However, in the study of Morris *et al.* (2010) spiritual change has earned the lowest score. However, in this study it was found that the

dimension of relationship with others earned the highest score after spiritual change dimension, this shows that the stressful and chronic diseases patients achieve different changes with regard to their new world, which these changes lean toward positive changes and cause an increase in their understanding about their new life with regard to changes that have occurred and this will cause an increase in their relationship with others.

In this study it was observed that there is a significant correlation between satisfaction and importance of the quality of life dimensions and posttraumatic growth that this finding is in line with the results of the study of Halam (2012) and Thoedoresco *et al.* (2012), where it was determined there is a direct and significant correlation between posttraumatic growth and quality of life<sup>15-16</sup>. Also, Tomich and Helgeson (2006) in their research stated that individuals whose mental dimension of their quality of life is lower, experience higher growth<sup>17</sup>. Contrary to the findings of this study, in the study of Bellizzi *et al.* (2010) who have studied the relationship between the quality of life and posttraumatic growth in breast cancer patients, it was shown that there is a significant relation between physical dimension of the quality of life and posttraumatic growth<sup>18</sup>.

In addition to the study of the general relation between the quality of life and posttraumatic growth it was found that life appreciation and formation of new opportunities dimensions have also a direct and significant correlation with the quality of life, life appreciation and new opportunities dimensions cause the commencement of the process of mental rehearsal, even though the process of the mental rehearsal of the incident is unpleasant, but it causes the restoration of previous schemes, in which new goals and understandings are created that can justify tough life events and give them meaning. As a matter of fact, the mental rehearsal of these unpleasant events are opportunities that through them more personal growth can be achieved, which this growth, in turn, causes improvement in the quality of life of individuals<sup>19</sup> and also with regard to correlation coefficient and significance that has been assessed between dimensions, among all dimensions, “spiritual-mental area” of the life satisfaction and “personal empowerment area” of the posttraumatic growth have higher correlation

with each other ( $p < 0.001$ ,  $r = 0.691$ ). This means that individuals who have better spiritual relationships will be stronger against hardships, because the followers of many religions have learned that they are not alone against difficulties and God is their friend and aid, in other words followers of religions solve their problems with the help of mediated control of God<sup>20</sup>. A direct and significant correlation between "spiritual changes" dimension of posttraumatic growth and quality of life in samples under study was also observed such that the participating individuals who had more spiritual changes reported higher quality of life score. This relationship can be justified with the fact that believing in God and dominant power is effective on stress reduction and promotes the physical and mental health and the quality of life<sup>21</sup>, because, in fact, an individual who believes in God experiences calamity in his/her life (Quran, chapter 13, verse 28), while Haydarzadeh *et al.* (2014) in their study reported that there is a reverse relationship between spiritual changes and physical-mental dimension of the equality of life; so that patients with low quality of life, from both physical and mental dimensions, reported more spiritual growth.

Based on the findings of this study it was determined the more time elapsed from the time of injury the amount of posttraumatic growth of the participants of the study has increased more, Salsman *et al.* (2008) in their research also concluded that posttraumatic growth increases by the time. Time passed after the accident, is assumed to be one of the factors that causes alteration of inefficient schemes and leads to growth, as a matter of fact, after some time of the moment of accident the person enters a new state of life with new schemes during which he/she tries to deal with different aspects of the incident and find meaning in them<sup>22</sup>.

### CONCLUSION

The performed studies on the impacts of traumatic events, including severe physical illnesses, show coping efforts may lead to the interpretation of the positive effects of the illness. Positive impacts and changes after events are a result of the cognitive process during which patients, by interpreting their illness, are after

finding a positive meaning from it and meanings that patients ascribe to their illness form the foundation of their behavior. For this purpose, it is necessary to develop strategies for better understanding of the concept of posttraumatic growth in the form of a training program workshop or a course to raise the awareness of nurses and medical staff about the meanings that patients ascribe to their illness, in order to with emphasis on positive aspects of the illness, patients do not perceive spinal cord injuries or any chronic and stressful illness as a completely negative event, and prevent psychological problems, and improve and increase the quality of life of patients.

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