Investigate the Relation between Metacognitive Beliefs and Cognitive Styles with Test Anxiety among Students Suffering from Cancer

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Abstract

The target of this research is the investigation of the relation between Metacognitive beliefs and cognitive styles with test anxiety among students suffering from cancer. The statistical population of the research included all the students who were studying in different universities of Tehran. 75 of them were selected by the method of convenience sampling and were assessed by using metacognitive beliefs, cognitive styles and test anxiety questionnaires. Then, the collected data were analyzed using multivariate regression. The findings of the study reveal that generally there is a significant relationship between metacognitive beliefs and cognitive styles with test anxiety of students suffering from cancer. In other words, the results indicate that metacognitive beliefs and cognitive styles specify almost 23.4% and 15.2% of "test anxiety" changes in students, respectively.

Keywords: Metacognitive Beliefs, Cognitive Styles, Test Anxiety, Cancer.

Introduction

Today, cancer is considered as an incurable disease and after its diagnosis, anxiety, depression and mental disorders follow (Bamshad & Safikhani, 2006; cited in Barghi Irani et al., 2013). This disease is characterized by abnormal cell deformation and loss of cell differentiation (Barghi Irani et al., 2013). Living with any chronic disease and what is done to treat it can be a source of serious social or psychological damage to the patient and his family (White, 2001, cited in Bahmani, 2013). One of the disorders that emerges after the diagnosis of the disease is anxiety and undoubtedly causes some problems for students who suffer from cancer in educational area. Empirical evidence also shows that anxiety disorders are correlate with hardships related to academic achievement (King & Ollendick, 1998, Melanie et al., 2010; cited in Kalantar Qureishi et al., 2012; Fernandez, 2012), poor social communication and poor relations with peers (Greco and Morris, 2005) and self-efficiency Kalantar Qureishi et al. (2012) in a study have come to the conclusion that anxiety

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has a negative effect on academic achievement and causes decline in academic achievement. The anxiety is often accompanied by unrelated thoughts that fill the consciousness part of the mind and disturb its normal functioning, in other words, it overshadows and undermines the concentration which is the base for studying and learning (Terry and Travis, 1999 cited in Rahmati & Saeedi, 2011). Test anxiety is a general expression that refers to a kind of special social anxiety or fear which makes people doubt their capabilities and its consequence is the reduction in the ability to deal with situations like exams, situations that put people under evaluation (Khosravi & Bigdeli, 2008; cited in Haji Abadi, 2014). One of the variables that seems to be associated with test anxiety is metacognitive beliefs. Metacognition is the information individual has of his cognitive system, with the development of the human cognitive system, a set of metacognitive and regulatory processes are formed that cause reward efficiency, flexibility of memory and purposeful and conscious learning. Various studies have shown that there is a relationship between certain aspects of metacognition and psychological disorders (Wells, 2001). Hudson and Ellis (cited in Bahadori et al., 2012) have indicated that concern is one of the fundamental components of anxiety disorders such as generalized anxiety disorder and social phobia which are particularly associated with negative and positive metacognitive beliefs. Spada et al (2012 cited in Bahadori et al., 2012) also consider metacognitive aspects such as positive metacognitive beliefs about concern and low cognitive confidence as the causative factors of anxiety. In addition, another study confirmed that there is a significant relationship between metacognitive aspects and social anxiety (Bahadori et al., 2012). Positive metacognitive beliefs about concern are beliefs that are related to individual's positive beliefs about effectiveness coping methods based on concern while these methods are incompatible. For example, concern means that I am ready and if I worry, I can deal with risks easier (Wells, 2005, cited in Bahadori et al., 2012). Metacognition is a multi-dimensional concept, this concept includes knowledge, processes and strategies that evaluate, supervise or control cognition. Studies have indicated that metacognitive beliefs correlate with Posttraumatic Stress Disorder (PTSD) (Ashoori et al., 2009). Another variable which seems to correlate with test anxiety and which is investigated in this study is individuals' cognitive styles. Cognitive styles refer to learners' perception, remembering and problem-solving. In other words, cognitive styles are relatively stable ways the individual, using them, receives, organizes and gives meaning to information. Cognitive style reveals an individual's fundamental layout and has physical basis. However, the individual is not very well aware of his own cognitive style because he has not experienced another individual's style. Cognitive styles supervise and control individuals' notions and views about events and ideas. They affect how an individual thinks about the events of his life, makes decisions and reacts. Cognitive styles also influence an individual's view on others and the way to communicate with them. An individual's cognitive style is his automatic way in sensitivity and reaction to information, stimuli and situations.an individual's cognitive style is almost constant and does not seem to be easily changed. An individual is not able to turn on/off his own style. However, he, with awareness of the type of his own style, can learn strategies with which he can maximize the strengths and advantages of his own style and minimize its weaknesses and limitations (Riding, translated by Asadzadeh, 2005). Cognitive styles affect education because they refer to how the human brain organizes perceptions and representations of the world around. Styles also influence the creation of groups, social relations and job performance, and management methods. One of the most famous learning styles is adaptive and innovative cognitive style. Kirton introduced the adaptive and innovative cognitive style as a way and individuals' preference for dealing with change, problem-solving, decision-making and the use of their creativity power (Asadzadeh, 2005). Kirton's adaption and innovation theory (1989; cited in Asadzadeh, 2005) basically attempts to describe and specify two styles of decision-making and problem-solving in individuals. Kirton believes everyone is creative, expressing his creativity in various ways. Furthermore, he considers creativity as the foundation of problem-solving, decision-making and innovation. According to Kirton, adaptors are keen to always do things better, while innovators try to do things differently. In other words, adaptors accept the existing issues and, in providing solutions, often adopt acceptable and common ways. However, innovators challenge existing problems and also try to provide new and creative solutions. Finally, considering the above-mentioned, the present study aim at answering the following question: Can metacognitive beliefs and adaptive innovative cognitive styles have any role in predicting test anxiety of students suffering from cancer?

Methodology

The method used in this study was quantitative, descriptive (non-experimental) and correlational. The data were also collected conducting questionnaires related to predictive and criterion variables. The statistical population of the study consisted of all university students who suffered from cancer and studied at different universities of Tehran, Iran in 2015-2016 academic year. Referring to Imam Khomeini and Imam Hussain hospitals and different branches of Islamic Azad University, 75 of them were selected using convenience sampling. To analyze the collected data, SPSS was used in two parts of descriptive statistics (mean and standard deviation) and inferential statistics (multivariate regression analysis).

Instrumentation

Cognitive Style Inventory (Innovation-Adaption): This instrument designed by Kirton, is a bipolar scale which puts people on a spectrum with two ends of the innovation and adaption. The questionnaire consists of 33 items with 5 choices of "very easy", "Easy", "Neither difficult nor easy", "difficult", and "very difficult". The choices are given a grade between 1 and 5, respectively. Each subject chooses one of the choices that is appropriate to his personality. Total score is the score of individual's innovation- adaption/compatibility. Theoretically, the minimum score, the maximum score, the mean, and the standard deviation are 32, 160, 96, and 16, respectively. The first phrase of this list is not graded and some phrases might be graded inversely. In this way, random careless responses can be avoided

since there is a tendency among respondents to agree or disagree with some phrases because they are socially desirable or undesirable. Results of validity examination of the questionnaire showed that it had the necessary and required validity in this research. In the present study, the convergent validity, using the correlation between the two components of innovation and adaption, was evaluated and the relevant coefficient was estimated 0.593. High correlation between two variables corroborates the notion that both components measure a single construct. Therefore, the questionnaire had convergent validity. Using Cronbach's alpha, the reliability of the questionnaire was calculated for adaptive style, innovative style and the entire questionnaire 0.77, 0.85, and 0.91, respectively.

Metacognitive Beliefs Questionnaire (Wells & Cartwright-Hatton, 2004): This instrument is a 30-item self-report scale that assesses individual differences in beliefs, metacognition, judgment and the monitoring trends. The questionnaire consisted of five subscales 1. Cognitive conflict 2. Positive beliefs 3. Cognitive self-awareness 4. Controllability and thoughts danger (or negative beliefs about uncontrollability and thoughts danger) 5. The need to control thoughts. Each item is scored on a four-degree Likert scale (disagree-slightly agree- almost agree-completely agree). Wells and Cartwright-Hatton (2004) in a study reported that the questionnaire had appropriate and acceptable internal consistency, convergent validity and test-retest reliability. The reliability of this study was calculated by Cronbach's alpha coefficient and this index for the five subscales of cognitive conflict, positive beliefs, cognitive self-awareness, controllability and thoughts danger, the need to control thoughts and ideas, and the entire questionnaire were 0.78, 0.74, 0.81, 0.79, 0.67, and 0.88.

Test Anxiety Questionnaire: In this study, standardized test anxiety questionnaire was used. The questionnaire was designed by Sarason 1960 and its reliability was confirmed, with correlation coefficient of 0.92 and compliance coefficient of 0.95, and used by the researchers of Iran University of Medical Sciences (Mahmoodi Alami, 2002). The questionnaire contains 30 questions with Yes/No answers. Its maximum score is 30 and the minimum score is zero and the division of scores is mild (0 to 10), moderate (11 to 20) and severe (21 to 30) is (SharifiRad et al., 2011) and in addition to test anxiety, it generally measures the academic anxiety of students in dealing with classroom, classmates and so on. In a study by Haji Abadi (2014), the Cronbach's alpha coefficient for the questionnaire was obtained 0.87.

Findings

In this part, before examining the hypotheses of the study, the descriptive indices of the variables of the study are shown in table1 and then, each of the hypotheses is examined using multivariate regression and the results are indicated in tables 2, 3, 4 and 5.

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Variables	Mean	Standard deviation
Cognitive Conflict	3.22	0.41
Positive Beliefs	3.25	0.44
Cognitive Self-Awareness	3.58	0.61
Controllability	3.23	0.42
Need To Control Thoughts	3.57	0.60
Innovators	3.59	0.55
Adaptors	3.61	0.48
Test Anxiety	11.79	6.40

Table 1. Mean and Standard Deviation of the Components of Metacognitive Beliefs, Cognitive Styles and Test Anxiety (N=146)

The results of table 1 indicate that the metacognitive beliefs variables have the mean of 3.22 to 3.58. It shows that the subjects of this study generally do not have undesirable condition in this part and the sum of the scores obtained for the mean of the variables of metacognitive beliefs is higher than the average. The mean of both "cognitive styles" is higher than average (that is score 3); the comparison of standard deviations also indicate higher distribution of the scores of "innovative style" than those of the "adaptive style". Besides, on average, the "test anxiety" of the participants of the study was estimated 11.79 and the standard deviation was calculated 6.4 which is within the average limit (11 to 20).

Hypothesis 1: metacognitive beliefs have a role in predicting test anxiety of students suffering from cancer.

Table 2	2. Summary	of Regression	Test to Predict	Test Anxiety on the	e Basis of N	Aetacognitive B	Beliefs

Model	Predictive Variables	R	\mathbb{R}^2	Adjusted Correlation	Sig
1	Metacognitive Beliefs	0.484	0.234	0.218	0.001

According to table 2, the correlation between "metacognitive beliefs" and "test anxiety" has been estimated 0.484. That is, metacognitive beliefs include: controllability, cognitive conflict, cognitive self-awareness, need to control thoughts and positive beliefs specify almost 23.4% of "anxiety test" changes of students (R^2 – 0.234).

Variables entering the model	model	В	SE	(Beta)	Т	Sig
	1. Intercept	37.1	3.1		11.9	0.001
Controllability	Variable Coefficient	0.279	0.211	0.102	3.6	0.001
Cognitive conflict	Variable Coefficient	0.264	0.164	0.225	3.3	0.001
Cognitive self-awareness	Variable Coefficient	0.435	0.157	0.209	3.8	0.001
Need to control thoughts	Variable Coefficient	0.290	0.089	0.228	3.3	0.001
Positive beliefs	Variable Coefficient	0.443	0.116	0.259	3.4	0.001

Table 3- Coefficients of Metacognitive Beliefs in Predicting Test Anxiety

As can be seen in the table above, the coefficients of "controllability", "cognitive conflict", "cognitive self-awareness", "need to control thoughts" and "positive thoughts" are significant at 0.01 level. In other words, controllability, cognitive conflict, cognitive self-awareness, the need to control thoughts and positive beliefs factors are able to significantly predict the anxiety of students who suffer from cancer.

Hypothesis two: innovative and adaptive cognitive styles have a role in predicting test anxiety of students suffering from cancer.

Table 4. Summary of Regression Test to Examine the Relationship between Cognitive Styles and Test Anxiety

Model	Predictive Variables	R	R ²	Adjusted Correlation	Sig
1	Innovative Style Adaptive Style	0.390	0.152	0.140	0.001

Based on the results of table 4, the correlation between "cognitive styles" and "test anxiety" was estimated 0.390. In other words, "innovative" and "adaptive" styles specify about 15.2% of "test anxiety" changes ($R^2 - 0.152$).

Variables entering the model model B SE (Beta) T Sig						
	1. Y-Intercept	55.6	9.60		5.70	0.001
Innovative Style	Variable Coefficient	0.240	0.243	0.094	0.98	0.001
Adaptive Style	Variable Coefficient	0.529	0.155	0.327	3.40	0.001

Table 5. Coefficients of Cognitive Styles in Predicting Test Anxiety

According to the results of table 5, the coefficient of "innovative style" is only significant at 0.01 level. In other words, "innovative" style is only able to significantly predict "test anxiety" of students.

Result and Discussion

The present study aims at investigating the relationship between metacognitive beliefs and cognitive styles, and test anxiety of students suffering from cancer. The results of the study indicated that generally there is a significant relationship between metacognitive beliefs and cognitive styles, and test anxiety of students suffering from cancer. The results of this study are in line with the results of previous studies conducted by Kalantar Qureishi et al., (2012), Fernandez (2012), Rahmati and Saeedi (2011), Wells (2001), Bahadori et al., (2012), and SalaryFa and Poor Etemad (2011). As mentioned earlier, suffering from cancer can cause psychological problems, especially anxiety for people. Those who study will suffer from a kind of anxiety called test anxiety. Some variables might create and intensify these individuals' test anxiety including metacognitive beliefs and cognitive styles. According to the metacognition theory in psychological disorder, metacognitions are sensitive components in predicting and creating psychological indications (Yilmaz et al., 2011). Psychological disorders are created when the individual's thinking style and compatibility involuntarily emphasize and boost emotional responses which are the results of rumination and anxiety (Scragg, 2010). Metacognitive model states that metacognition is responsible for controlling the healthy and the unhealthy in the mind, and what determines emotions and the way they are controlled is the way an individual thinks, not what the individual thinks of. Metacognitive approach believes that individuals are trapped in emotional problems because their metacognition leads to a special pattern of responding to internal experiences that result in the continuation of negative emotion and reinforcing negative beliefs (Poornamdarian et al., 2012). Thus, an individual's metacognitive beliefs can have a role in creating stress, anxiety or in other words, tension or conflict in an individual. Shuarez and Clore (1988, cited in Poornamdarian, 2012) state that people use their feelings as information for evaluations and judgments, hence negative evaluations cause psychological disorganizations and the lack of appropriate performance. Besides, the metacognitive belief of uncontrollability makes people doubt their capabilities and abilities and that negatively affects their psychological health. When individuals feel they do not have any control on life and events, they show more symptoms of depression, tension and anxiety (Poornamdarian, 2012). Expressing positive emotions brings about better learning environment and better academic skills (Froyen, et al., 2013), and negative emotions such as anxiety, not only exacerbates the disease (Scragg et al., 2010), but also bring about less academic joy and pride and lower level of motivation in educational environments (Kim & Hodges, 2012), and experiencing much positive emotions, due to the increase of autonomous learning, increases academic achievement (Mega et al., 2014), and to the same extent decreases depression, anxiety and physical symptoms (Niles

et al., 2014). Furthermore, cognitive styles may have positive effects in some assignments and negative effects in other assignments; because an assignment might be difficult for an individual who is at the end of a continuum while it might be easy for an individual who is in the other end of the same continuum (Atkinson, 2004). It seems that students who use innovative cognitive style, because of creative mentality, try to solve problems using new and different solutions, and this attempt for creativity and innovation may cause more anxiety for them than the students who use adaptive uncreative style. In end, it seems that with the improvement of metacognitive beliefs and cognitive styles, the test anxiety of the students suffering from cancer can reduce.

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