Research Paper: Prediction of Test Anxiety Based on Metacognitive Beliefs and Perfectionism

Mohammadreza Tamannaeifar[1*], Saeedeh Abdolmaleki[1]

1. Department of Psychology, Faculty of Humanities, University of Kashan, Kashan, Iran.

Use your device to scan and read the article online

Citation: Tamannaeifar, M., Abdolmaleki, S. (2017). Prediction of Test Anxiety Based on Metacognitive Beliefs and Perfectionism. *Journal of Practice in Clinical Psychology, 5*(1), 63-71. https://doi.org/10.18869/acadpub.jpcp.5.1.63

doi: https://doi.org/10.18869/acadpub.jpcp.5.1.63

Article info:
Received: 16 Jul. 2016
Accepted: 27 Oct. 2016

Keywords:
Test anxiety, Metacognitive beliefs, Perfectionism

ABSTRACT

Objective: The purpose of the present study was to investigate the association of metacognitive beliefs and perfectionism with test anxiety among students.

Methods: The present study was a cross sectional research. Study population comprised all male and female students of Kermanshah City. A total of 440 students (200 males and 240 females, aged 17-18 years) in the third or fourth grade of Kermanshah high schools (academic year 2015-2016) were selected by random cluster sampling method. The data were collected using test anxiety inventory, metacognitions questionnaire, and multidimensional perfectionism scale. For analyzing the data, we used analysis of regression method.

Results: There were significant positive correlations between the test anxiety with cognitive confidence ($r = 0.29$, $P < 0.01$), positive beliefs ($r = 0.10$, $P < 0.05$), cognitive self-consciousness ($r = 0.35$, $P < 0.01$), uncontrollability and danger of thoughts ($r = 0.45$, $P < 0.01$), and need to control thoughts ($r = 0.16$, $P < 0.05$). Also, there was significant positive correlations between test anxiety with concern over mistakes ($r = 0.36$, $P < 0.01$), doubts about actions ($r = 0.41$, $P < 0.01$), parental expectations ($r = 0.23$, $P < 0.01$), parental criticism ($r = 0.33$, $P < 0.01$), personal standards ($r = 0.40$, $P < 0.01$) and organization ($r = 0.16$, $P < 0.05$). Moreover, analysis of regression indicated metacognitive beliefs and perfectionism are predictors of test anxiety.

Conclusion: Results of this study support the metacognitive model of test anxiety and showed that people's metacognitive beliefs have important role in test anxiety. Also, results indicated perfectionist individuals are vulnerable for test anxiety.

1. Introduction

Anxiety is a common and undeniable phenomenon in human beings, which affects their performance and efficiency in different situations. However, high level of anxiety threatens one's mental and physical health and has a negative effect on one's personal, social, familial, occupational, and educational performance (Ghahvechi-Hosseini, Fathi Ashtiani, & Satkin, 2015). According to the estimation performed by researchers, the reported prevalence of test anxiety in high school and university students is between 10% and 30% (Alsina et al., 2007).

People differ in their level of experienced anxiety (Betrams, Englert, & Dickhauser, 2013; Hernandez, Menchaca, & Huerta, 2011). A small amount of anxiety could be good. It acts as motivation and can increase

*** Corresponding Author:**
Mohammadreza Tamannaeifar, PhD
Address: *Department of Psychology, Faculty of Humanities, University of Kashan, Kashan, Iran.*
Tel: *+98 (31) 55913752*
E-mail: *tamannai@kashanu.ac.ir*

achievement by pushing the students to do their best (Akanbi, 2013). On the other hand, too much anxiety can disturb mental skills that students need to be successful on tests (Casbarro, 2005). One of the most important problems in schools is test anxiety. Test anxiety is defined as a feeling of uneasiness or apprehension before, during, or after a test because of worry or fear (Shokrpour, Zareii, Zahedi, & Rafatbakhsh, 2011).

Test anxiety affects people of all ages who have to be evaluated, assessed, and graded on their abilities or achievements (Lufi, Okasha, & Cohen, 2004). Test anxiety is an important factor in all academic levels; primary, secondary, and tertiary (Akanbi, 2013; Hernandez, Menchaca, & Huerta, 2011). Test anxiety has become one of the most troublesome factors in schools (Farooqi, Ghani, & Spielberger, 2012) and many students with test anxiety cannot concentrate on the test questions, which in turn cause poor performance on tests (Atasheneh & Izadi, 2012).

Many researchers have emphasized the role of cognition in test anxiety. Several studies have found that metacognitive beliefs have important effects on anxiety and test anxiety (Azimi et al., 2014). Metacognition as a multifaceted concept can be defined as internal cognitive factors that control, monitor, and appraise thinking. It can be subdivided into metacognitive knowledge (e.g. "I must worry in order to cope"), experiences (e.g. "a feeling of knowing"), and strategies (e.g. ways of controlling thoughts and protecting beliefs") (Wells, 2009). Several studies have indicated the causal role of metacognitive in the development and persistence of psychological disorders (Fisher & Wells, 2008).

There is a distinction between two major facets of metacognition (Zahedi Tajrishia, Mohammadkhanib, & Jadidi, 2011): metacognitive regulation and metacognitive knowledge (or metacognitive beliefs). Metacognitive regulation refers to processes that coordinate cognition. These include both bottom-up processes, i.e., cognitive monitoring (source monitoring in memory retrieval) and top-down processes, i.e., cognitive control (conflict resolution). Metacognitive knowledge refers to acquired knowledge about cognitive processes and knowledge that can be used to control cognitive processes. Flavell further divides metacognitive knowledge into three categories: knowledge of person variables, task variables, and strategy variables (Livingston, 1996).

According to the self-regulatory executive function (S-REF) theory, metacognitive knowledge (metacognitions) predisposes individuals to develop response patterns to thoughts and internal events that are characterized by heightened self-focused attention, recyclical thinking patterns, avoidance and thought suppression, and threat monitoring (Zahedi Tajrishia, Mohammadkhanib, & Jadidi, 2011). Metacognitive beliefs have been found to be positively associated with alcohol use (Spada, Georgio & Wells, 2010), smoking dependence (Spada, Nikčević, Moneta, & Wells, 2006), depression (McEvoy, Mahoney, Perini & Kingsep, 2009), obsessive-compulsive symptoms (Metehan, Tosun, 2008), trait-state anxiety (Delavar et al., 2014), and test anxiety (Spada, Nikčević, Moneta, & Ireson, 2006).

The metacognitive model of anxiety (Wells, 1995, 2009) was developed to explain cognitive processes associated with pathological worry in adults, particularly the role of positive and negative beliefs about worry. Research in adult populations suggests that endorsement of positive beliefs about worry is linked with worry level (Wells, 2007). The metacognitive model of anxiety in adult populations has proved helpful in better understanding of the cognitive processes associated with pathological worry, and emerging research supports the downward extension of this model to understand worry in child and adolescent populations (Elis & Hudson, 2010).

Laugesen et al. (2003) reported that in a sample of school students aged 14 to 18 years, positive beliefs about worry increased as worry level rose. Barahmand (2008) conducted a study on school students aged 16 to 19 years and concluded that positive beliefs about worry were positively associated with worry and anxiety. Similarly, Gosselin et al. (2007) found that in a sample of school students aged 12 to 19 years, beliefs regarding the usefulness of worry were positively correlated with worry level. This included the belief that worry both helps to solve problems and avoid the worst. There is mixed evidence for the hypothesis that positive beliefs about worry are normal in young people with and without pathological worry (Ellis & Hudson, 2010).

Wells (1995, 2009) suggested that activation of negative beliefs about the uncontrollability and danger of worry would uniquely contribute to the development and maintenance of pathological worry in anxiety. Likewise, Cartwright-Hatton et al. (2004) found out that clinical youth with anxiety disorder reported significantly higher levels of negative beliefs about worry compared to non-clinical youth. In contrast, Bacow et al. (2009) reported that there were no significant differences between clinically anxious and non-clinical participants with regard to negative beliefs about worry. It is only through ongoing research that our understanding of worry can be further advanced in child and adolescent populations (Ellis & Hudson, 2010).

Other variable affecting test anxiety is perfectionism. The first multidimensional measure of perfectionism was developed by Frost et al. (1990) and consisted of 6 dimensions that included concern over mistakes, doubts about actions, parental expectations, personal standards, parental criticism, and organization. Perfectionists excessively value their personal achievements, so it was assumed that testing situations might result in significant distress. Following this, test anxiety can be conceptualized as a disposition to react with increased anxiety in the face of situations that are related to performance-related contexts (Hodapp, Glanzmann, & Laux, 1995). Accordingly, several studies indicated that test anxiety was related to perfectionism in students (Bieling, Israeli, Smith, & Antony, 2003). Results from a correlational study yielded that negative perfectionism was strongly associated with test anxiety (Stoeber, Feast, & Hayward, 2009). Other authors have found that this relationship occurr more sharply in female students (Eum & Rice, 2011).

An important issue about perfectionist students is how they cope before exams. Many studies have offered support for the notion that maladaptive perfectionists engage more frequently in dysfunctional ways of coping while adaptive perfectionists often employ a more functional strategy (Burns & Fedewa, 2005; Flett, Hewitt, Blankstein, Solnik, & Van Brunschot, 1996). Flett, Hewitt, Blankstein, Solnik, and Van Brunschot (1996), for example, found that maladaptive perfectionists use negative problem-solving strategies compared to adaptive perfectionists. Apparently, the latter tend to use more flexible coping resources (Karmakar & Ray, 2014; Larijani & Besharat, 2010).

Since perfectionism is defined as a cognitive pattern of expectations characterized by inflexible goals, concerns over mistakes, doubts about actions, high standards (Kazemi, 2010), also maladaptive perfectionism involves an excessive concern about falling short of high standards (Arana & Furlan, 2016), there might be a relationship between perfectionism and negative metacognitive beliefs. Thus, perfectionism and metacognitive beliefs can be understood as factors influencing the development and continuation of test anxiety. Considering these points, the present study aimed to predict test anxiety based on metacognitive beliefs and perfectionism.

2. Methods

This study used a correlational research method. Study population comprised all male and female students of Kermanshah high schools. A total of 440 students (200 males and 240 females, aged 17- 18 years) in the third or fourth grade of Kermanshah high schools (years 2015-2016) were selected by random cluster sampling method. The study data were collected using test anxiety inventory, metacognitions questionnaire, and multidimensional perfectionism scale. First, six girl and five boy schools were randomly selected. Then, the two classes were selected from each school.

Written informed consents were obtained from the subjects. Peoples who agreed to participate in this study were asked to complete the questionnaires. Also, objectives of the study were fully explained to participants. For analyzing the data, analysis of regression method was used.

Test Anxiety Inventory (TAI): This questionnaire consists of 20 items. The subjects are instructed to respond according to how they generally feel by reporting the frequency of their experiences. The responses to items of test anxiety questionnaire have 4-point scale rated as follows: 1, almost never; 2, sometimes; 3, often; and 4, almost always. The mean score for was determined 20 items (TAI total score). Eight items belonged to worry (W) and 12 items, emotion (E) subscales. This test does not have any diagnostic cut-off point and the results should be interpreted through comparison. The reliability coefficient of the test was measured via test-retest method on a sample of 52 male and female Iranian students. The analysis revealed a reliability coefficient of 0.89.

Metacognitive questionnaire (MCQ-30) was designed based on metacognitive model by Cartwright-Hatton and Wells (1997) to evaluate individual differences related to positive and negative beliefs in worry and unwanted thoughts, metacognitive monitoring, and judgment of cognitive efficiency. This questionnaire comprised 30 questions and 5 subscales about metacognition (Bahrami, 2010) as follows: 1) congestion reliance, 2) positive beliefs about worry, 3) cognition awareness, 4) dangerous and uncontrollable thoughts, and 5) need to control thoughts. The answers were scored based on 4-point Likert-type scale as 1: completely disagree, 2: relatively disagree, 3: relatively agree, 4: completely agree. Minimum achievable score at this 30-item test equals 30 and maximum 120. Total point for upward cognition was attained by sum of points under the scales. The psychometric properties of this questionnaire was assessed by Mohammadi et al. in Iran, in 2001. The Cronbach α was reported for validity of this questionnaire as 0.74 and for reliability as 0.81(Delavar, et al., 2014).

Frost Multidimensional Perfectionism Scale (FMPS): This is a 35-item scale, which measures 6 different dimensions of perfectionism: concern over mistakes, doubts about actions, parental expectations, parental

criticism, personal standards, and organization (Frost, Marten, Lahart, & Rosenblate, 1990).

Frost et al. (1990) reported good convergent validity between the FMPS and other measures of perfectionism. Dunkley, Blankstein, Halsall,Williams, and Winkworth (2000) used the concern over mistakes and doubts about actions dimensions to measure evaluative concerns perfectionism, and the personal standards dimension to measure personal standards perfectionism. Weiner and Carton (2012) replicated their methodology, for these dimensions best represent the two forms of perfectionism they sought to investigate. The self-report items are scored in a Likert-type format, where participants rate items on a scale ranging from 1 (strongly disagree) to 5 (strongly agree). An example item is "I hate being less than best at things." According to previous research, the dimensions of "concern over mistakes" and "doubts about actions" were averaged and combined into a single dimension to measure the larger construct of evaluative concerns perfectionism. Analyses revealed that the personal standards dimension (a = 0.81) and evaluative concerns dimension (a = 0.85) of the FMPS were both acceptably reliable in the present study. The personal standards item-total correlations ranged from 0.42 to 0.71, and the evaluative concerns item-total correlations ranged from 0.35 to 0.70 (Weiner & Carton, 2012). Soysa and Weiss, (2014) reported the Cronbach α for maladaptive perfectionism as 0.90.

The Pearson correlations were computed to investigate the relationship between the metacognitive beliefs and perfectionism with test anxiety. Also, a stepwise multiple regression analysis was carried out to determine the contributions of metacognitive beliefs and perfectionism in prediction of test anxiety. The predictors included were metacognitions subscales and perfectionism dimensions and the predicted variable was the TAI total.

3. Results

Results of the descriptive statistics (Mean and standard deviation) for all variables are presented in Table 1. In Tables 2 and 3, the Pearson correlations of variables are presented. There were significant positive correlations between the test anxiety with cognitive confidence (r = 0.29, P < 0.01), positive beliefs (r = 0.10, P < 0.05), cognitive self-consciousness (r = 0.35, P < 0.01), uncontrollability and danger of worry thoughts (r = 0.45, P < 0.01) and need to control thoughts (r = 0.16, P < 0.05).

Table 1. Mean and standard deviation of test anxiety, metacognitive beliefs, and perfectionism

Variable	Mean	SD	Minimum	Maximum
Test anxiety	18.51	6.01	2	35
Metacognitive beliefs	64.43	13.51	30	116
Cognitive confidence	10.92	4.28	6	24
Positive beliefs	12.36	3.27	6	24
Cognitive self-consciousness	15.09	3.88	6	24
Uncontrollability and danger of worry thoughts	13.14	4.15	6	24
Need to control thoughts	12.90	3.29	6	24
Perfectionism	109.79	19.80	35	162
Concern over mistakes	22.83	6.28	8	40
Doubts about actions	16.60	3.36	4	20
Parental expectations	16.26	4.56	5	25
Parental criticism	10.26	3.29	4	20
Personal standards	23.28	4.91	7	45
Organization	21.53	5.30	6	30

Table 2. Correlation of metacognitive beliefs with test anxiety

	Variable	1	2	3	4	5	6	7
1	Test anxiety	1						
2	Metacognitive beliefs	0.30**	1					
3	Cognitive confidence	0.29**	0.31**	1				
4	Positive beliefs	0.10*	0.50**	0.19**	1			
5	Cognitive self-consciousness	0.35**	0.51**	0.14*	0.52**	1		
6	Uncontrollability and danger of worry thoughts	0.45**	0.52**	0.48**	0.32**	0.36**	1	
7	Need to control thoughts	0.16*	0.57**	0.42**	0.52**	0.48**	0.48**	1

PRACTICE in CLINICAL PSYCHOLOGY

**P < 0.01.

*P < 0.05.

Table 3. Correlation of components of perfectionism with test anxiety

	Variable	1	2	3	4	5	6	7	8
1	Test anxiety	1							
2	Perfectionism	0.32**	1						
3	Concern over mistakes	0.36**	0.80**	1					
4	Doubts about actions	0.41**	0.62**	0.52**	1				
5	Parental expectations	0.23**	0.75**	0.52**	0.35**	1			
6	Parental criticism	0.33**	0.52**	0.48**	0.42**	0.33**	1		
7	Personal standards	0.40**	0.75**	0.42**	0.24**	0.52**	0.14*	1	
8	Organization	0.16*	0.59**	0.18*	0.19**	0.34**	-0.10*	0.63**	1

PRACTICE in CLINICAL PSYCHOLOGY

**P < 0.01.

*P < 0.05.

Table 4. Regression analyses of metacognitive beliefs to test anxiety

Step	Predictor Variable	β	B	t	R	R^2	Adjusted R^2	R^2 Change	P
1	Uncontrollability and danger of worry thoughts	0.66	0.45	10.73	0.45	0.20	0.20	0.20	< 0.000
	Constant	9.82		11.56					< 0.000
2	Uncontrollability and danger of worry thoughts	0.75	0.51	11.55	0.48	0.23	0.23	0.02	< 0.000
	Cognitive self-consciousness	-0.26	-0.17	-3.83					< 0.000
	Constant	12.66		11.32					< 0.000

PRACTICE in CLINICAL PSYCHOLOGY

Table 5. Regression analyses of components of perfectionism to test anxiety

Step	Predictor Variable	β	B	t	R	R^2	Adjusted R^2	R^2 Change	P
1	Doubts about actions	0.74	0.41	9.55	0.41	0.17	0.17	0.17	< 0.000
	Constant	9.89		10.52					< 0.000
2	Doubts about actions	0.59	0.33	7.08	0.45	0.20	0.20	0.03	< 0.000
	Parental criticism	0.35	0.19	4.14					< 0.000
	Constant	7.93		7.65					< 0.000
3	Doubts about actions	0.49	0.27	5.41	0.46	0.21	0.21	0.01	< 0.000
	Parental criticism	0.27	0.15	3.02					< 0.000
	Concern over mistakes	0.13	0.14	2.57					< 0.05
	Constant	6.70		5.94					< 0.05
4	Doubts about actions	0.51	0.28	5.59	0.48	0.23	0.22	0.01	< 0.000
	Parental criticism	0.25	0.13	2.79					< 0.000
	Concern over mistakes	0.19	0.20	3.56					< 0.05
	Personal standards	-0.16	-0.13	-2.89					< 0.000
	Constant	9.27		6.49					< 0.05

PRACTICE in CLINICAL PSYCHOLOGY

Also, the significant positive correlations were observed between test anxiety with concern over mistakes ($r = 0.36$, $P < 0.01$), doubts about actions ($r = 0.41$, $P < 0.01$), parental expectations ($r = 0.23$, $P < 0.01$), parental criticism ($r = 0.33$, $P < 0.01$), personal standards ($r = 0.40$, $P < 0.01$) and organization ($r = 0.16$, $P < 0.05$). Results of the regressions analyses are presented in Tables 4 and 5. Uncontrollability and danger of worry thoughts and cognitive self-consciousness predict 23% variation of test anxiety. Also, doubts about actions, parental criticism, concern over mistakes, and personal standards predict 23% variation of test anxiety and role of doubts about actions is more.

4. Discussion

Anxiety has attested to be one of the important affective filters associated with success and/or failure in learning. Anxious children and adolescents may perform below their true abilities (Paul, 2013; Ramirez & Beilock, 2011). Children and adolescents who have episodes of anxiety (which have never been diagnosed and treated) can experience serious negative impacts on their current and future academic achievements and developments (Grover, Ginsburg, & Ialongo, 2007). Test anxiety has become one of the most troublesome factors in schools (Farooqi, Ghani, & Spielberger, 2012). Thus, the current study aimed to predict test anxiety based on metacognitive beliefs and perfectionism. Results indicated significant relationship between metacognitive beliefs and test anxiety. Previous studies have found similar results. Spada et al. (2006) reported that metacognitive beliefs were mediators between stress and negative emotions. Also, metacognitive beliefs influence anxiety and resulted in development and ongoing disorder.

Viewpoint of metacognition believe that anxiety is one of the most essential forms of metacognitive inconsistencies making the base of anxiety disorders. Metacognitive beliefs predict the experience of negative emotions like anxiety. Research evidence indicates that metacognitive beliefs have positive and significant relationships with anxiety and stress (Spada, Georgiou, & Wells, 2010). The research shows that improvement of negative metacognitive beliefs is effective on the reduction of anxiety symptoms (Bahrami, 2010). When test anxiety occurs, many attentional-cognitive processes interfere in performance (Behpajoh et al., 2009).

Attentional-cognitive syndrome results in continuation of threat feeling. When negative metacognitive beliefs were activated, person evaluates negativity worry that means worry about worry. This problem increases anxiety and coping insufficiency (Azimi et al., 2014). Therefore, negative beliefs about the danger and uncontrollability of worry (e.g. "My worrying is bad for me") are associated with pathological worry (Wells, 2009). Test anxious people pay more attention on their anxiety, therefore, their performances decrease as their efforts concentrating on the task is minimal (Orfus, 2008).

In self-regularity executive function model, cognitive vulnerability has symptoms analogs to psychological disorder and disorder continuity. These symptoms are diagnosed as intensified self-focused attention, threat monitoring, ruminative processing, activation of maladaptive beliefs, and inefficient self-regularity strategies (Delavar et al., 2014). These symptoms are stimulated by metacognitive beliefs of sufferer and act as reference and resource for interpretation and control of the cognitive events (Wells, 2007).

Moreover, the present study showed significant relationship between perfectionism and test anxiety. Previous studies (Stöeber, Feast, & Hayward, 2009; Eum & Rice, 2011; Soysa & Weiss, 2014) have found similar results. Perfectionism is often conceptualized as the long-term setting and striving for unrealistically high goals, and focusing on flaws in achieving these goals. It is defined as the setting of extremely high standards while being overly critical during self-evaluations. When students cannot reach these unrealistic goals, they will be harshly critical of themselves (Soysa & Weiss, 2014). Research has found that test anxiety is relatively stable over time and that individuals who report high test anxiety often struggle with feelings of inadequacy. Perfectionists are likely to use avoidant coping behaviors during a testing situation by focusing on irrelevant stimuli, such as the standards others have set for them or by becoming distracted with worry.

Low test anxious students appraise their abilities and evaluate their present behavior in a testing situation, thereby engaging in self-focus, they tend to remain confident in their work and are able to redirect their attention to the problem at hand (Weiner & Carton, 2012). Perfectionists with high standards tend to suffer more from test anxiety (Arana & Furlan, 2016). Standards are related to dimensions of worry and emotionality about test anxiety. Stoeber et al. (2009) found a similar result with worry and highlighted the ambivalent role of having high standards. However, it is reasonable to expect that holding of this trait contributes to the activation of worry because assessment situations may trigger the desire to achieve excellence.

Regarding that test anxiety affects a significant number of students and those who suffer from it tend to perform more poorly in school than their low anxious peers, it is necessary to design interventions directed to metacognition and perfectionism for reducing test anxiety.

Since the current study investigated the role of metacognitions and perfectionism in test anxiety in general population, it is difficult to generalize our study results to clinical population. Using self-report questionnaire is another limitation of the present study. It may be of benefit to conduct research where the metacognitive beliefs of youth with test anxiety be evaluated in comparison with other anxiety disorders and non-clinical samples. Based on metacognitive theory, it would be expected that there will be no differences between these groups on positive beliefs about worry.

Acknowledgments

This research did not receive any specific grant from funding agencies in the public, commercial, or not-for-profit sectors. We are grateful to students and principals of schools for contributing to this research.

Conflict of Interest

The authors declared no conflict of interests.

References

Alsina-Jurnet, I., Carvallo-Beciu, C., & Gutiérrez-Maldonado, J. (2007). Validity of virtual reality as a method of exposure in the treatment of test anxiety. *Behavior Research Methods, 39*(4), 844–851. doi: 10.3758/bf03192977

Arana, F. G., & Furlan, L. (2016). Groups of perfectionists, test anxiety, and pre-exam coping in Argentine students. *Personality and Individual Differences,* 90, 169–173. doi: 10.1016/j.paid.2015.11.001

Akanbi, S. T. (2013). Comparisons of test anxiety level of senior secondary school students across gender, year of study, school type and parental educational background. *Ife PsychologIA*, 21(1), 40–54.

Atasheneh, N., & Izadi, A. (2012). The role of teachers in reducing/increasing listening comprehension test anxiety: A case of Iranian EFL learners. *English Language Teaching*, 5(3), 178–18. doi: 10.5539/elt.v5n3p178

Azimi, M., Shakeri, M., Nori, R., & Hatami, M. (2014). [Effectiveness of metacognitive therapy (MCT) on reducing test anxiety and changing the metacognitive beliefs of the eleventh and twelfth grade students (Persian)]. *Journal of North Khorasan University of Medical* Sciences, 6(3), 591-600.

Bacow, T. L., Pincus, D. B., Ehrenreich, J. T., & Brody, L. R. (2009). The metacognitions questionnaire for children: Development and validation in a clinical sample of children and adolescents with anxiety disorders. *Journal of Anxiety Disorders, 23*(6), 727–736. doi: 10.1016/j.janxdis.2009.02.013

Bahrami, F. (2010) [Metacognition and maladaptive coping as components of test anxiety (Persian)]. *Clinical Psychiatry and Psychology*. *6*(2), 111-125.

Barahmand, U. (2008). Temperament, Parenting and Behavior Problems: A Cultural Difference. Rawal Medical Journal, 33(2), 217-220.

Behpajoh, A., Besharat, M. A., Ghobari, B., & Fooladi, F. (2009). [Effect of training cognitive-behavioral strategies on reduction test anxiety in high school girl students (Persian)]. *Journal of psychology and educational sciences, 39,* 3-21

Bertrams, A., Englert, C., Dickhäuser, O., & Baumeister, R. F. (2013). Role of self-control strength in the relation between anxiety and cognitive performance. *Emotion, 13*(4), 668–680. doi: 10.1037/a0031921

Bieling, P. J., Israeli, A., Smith, J., & Antony, M. M. (2003). Making the grade: the behavioural consequences of perfectionism in the classroom. *Personality and Individual Differences, 35*(1), 163–178. doi: 10.1016/s0191-8869(02)00173-3

Burns, L. R., & Fedewa, B. A. (2005). Cognitive styles: Links with perfectionistic thinking. *Personality and Individual Differences, 38*(1), 103–113. doi: 10.1016/j.paid.2004.03.012

Cartwright-Hatton, S., Mather, A., Illingworth, V., Brocki, J., Harrington, R., & Wells, A. (2004). Development and preliminary validation of the Meta-cognitions Questionnaire—Adolescent Version. *Journal of Anxiety Disorders, 18*(3), 411–422. doi: 10.1016/s0887-6185(02)00294-3

Cartwright-Hatton, S., & Wells, A. (1997). Beliefs about worry and intrusions: The Meta-Cognitions Questionnaire and its correlates. *Journal of Anxiety Disorders, 11*(3), 279–296. doi:10.1016/s0887-6185(97)00011-x

Casbarro, J. (2005). *Test anxiety & what you can do about it*. New York: Dude Publishing.

Davis, L. W., & Lysaker, P. H. (2005). Cognitive behavioral therapy and functional and metacognitive outcomes in schizophrenia: A single case study. *Cognitive and Behavioral Practice, 12*(4), 468–478. doi: 10.1016/s1077-7229(05)80074-4

Delavar, B., Dolatshahi, B., Nouri, M., Aryanfar, K. (2014). Metacognition and depression, state anxiety and trait anxiety symptoms, *Journal of Practice in Clinical Psychology*, *2*(3), 195-200.

Dunkley, D. M., Blankstein, K. R., Halsall, J., Williams, M., & Winkworth, G. (2000). The relation between perfectionism and distress: Hassles, coping, and perceived social support as mediators and moderators. Journal of Counseling Psychology, 47(4), 437-53.

Ellis, D. M., & Hudson, J. L. (2010). The metacognitive model of generalized anxiety disorder in children and adolescents. *Clinical Child and Family Psychology Review, 13*(2), 151–163. doi: 10.1007/s10567-010-0065-0

Eum, K., & Rice, K. G. (2011). Test anxiety, perfectionism, goal orientation, and academic performance. *Anxiety, Stress & Coping, 24*(2), 167–178. doi: 10.1080/10615806.2010.488723

Farooqi, Y., Ghani, R., & D. Spielberger, C. (2012). Gender differences in test anxiety and academic performance of medical students. *International Journal of Psychology and Behavioral Sciences,* 2(2), 38–43. doi: 10.5923/j.ijpbs.20120202.06

Arana, F. G., & Furlan, L. (2016). Groups of perfectionists, test anxiety, and pre-exam coping in Argentine students. *Personality and Individual Differences,* 90, 169–173. doi: 10.1016/j.paid.2015.11.001

Fisher, P. L., & Wells, A. (2008). Metacognitive therapy for obsessive–compulsive disorder: A case series. *Journal of Behavior Therapy and Experimental Psychiatry, 39*(2), 117–132. doi: 10.1016/j.jbtep.2006.12.001

Flett, G. L., Hewitt, P. L., Blankstein, K. R., Solnik, M., & Van Brunschot, M. (1996). Perfectionism, social problem-solving ability, and psychological distress. *Journal of Rational-Emotive and Cognitive-Behavior Therapy, 14*(4), 245–274. doi: 10.1007/bf02238139

Frost, R. O., Marten, P., Lahart, C., Rosenblate, R. (1990). The dimensions of perfectionism. *Cognitive Therapy and Research, 14*(5), 449–468. doi: 10.1007/BF01172967

Ghahvechi Hosseini, F. Fathi Ashtiani, A., & Satkin., M. (2015). Comparing metacognitive therapy with cognitive therapy on reducing test anxiety and meta-worry in students. *Journal of Practice in Clinical Psychology*, *3*(3), 213-218.

Gosselin, P., Langlois, F., Freeston, M. H., Ladouceur, R., Laberge, M., & Lemay, D. (2007). Cognitive variables related to worry among adolescents: Avoidance strategies and faulty beliefs about worry. *Behaviour Research and Therapy, 45*(2), 225–233. doi: 10.1016/j.brat.2006.03.001

Grover, R. L., Ginsburg, G. S., & Ialongo, N. (2007). Psychosocial outcomes of anxious first graders: A seven-year follow-up. *Depression and Anxiety, 24*(6), 410–420. doi: 10.1002/da.20241

Hernandez, R., Menchaca, V., & Huerta, J. (2011). A study of the relationship between students' anxiety and test performance on state-mandated assessments. *US –China Education Review*, 4, 579–585.

Hodapp, V., Glanzmann, P. G., & Laux, L. (1995). *Theory and measurement of test anxiety as a situation specific trait.* In C. D. Spielberger., & P. R. Vagg (Eds.), Test Anxiety. Theory, Assessment, and Treatment (pp. 47–58). London: Taylor & Francis.

Karmakar, R., & Ray, A. (2014). Adaptive and maladaptive perfectionists: Do they really differ on hardiness and using coping strategy? *International Journal of Innovative Research & Development*, 3, 380–386.

Kazemi, F. (2010). [*Comparison of perfectionism dimensions and locus of control among students with high test anxiety and normal* (Persian)] (MA thesis), *Tehran:* University of Allameh Tabataba'i.

Larijani, R., & Besharat, M. A. (2010). Perfectionism and coping styles with stress. *Procedia-Social and Behavioral Science*, 5, 623–627. doi: 10.1016/j.sbspro.2010.07.154

Laugesen, N., Dugas, M. J., & Bukowski, W. M. (2003). Understanding adolescent worry: The application of a cognitive model. *Journal of Abnormal Child Psychology*, *31*(1), 55–64. doi: 10.1023/a: 1021721332181

Livingston, J. A. (1996). *Effects of metacognitive instruction on strategy use of college students.* Buffalo: State University of New York at Buffalo.

Lufi, D., Okasha, S., & Cohen, A. (2004). Test anxiety and its effect on the personality of students with learning disabilities. *Learning Disability Quarterly, 27*(3), 176–184. doi: 10.2307/1593667

McEvoy, P. M., Mahoney, A., Perini, S. J., & Kingsep, P. (2009). Changes in post-event processing and metacognitions dur-

ing cognitive behavioral group therapy for social phobia. *Journal of Anxiety Disorders, 23*(5), 617–623. doi: 10.1016/j.janxdis.2009.01.011

Metehan, I., & Tosun, A. (2008). Exploring the role of metacognition in obsessive–compulsive and anxiety symptoms. *Journal of Anxiety Disorders, 22,* 1316-1325.

Orfus, S. (2008). The effect test anxiety and time pressure on performance. *The Huron University College Journal of Learning and Motivation*, *46*(1), 118-133.

Paul, A. M. (2013). Relax, it's only a test. *Time, 181*(5), 42–45.

Spada MM, Georgiou GA, Wells A. (2010). The relationship among metacogni¬tion, attention control and state anxiety. *Cognitive behavioral therapy, 39*(1), 64-71. doi: 10.1080/16506070902991791

Spada, M. M., Georgiou, G. A., & Wells, A. (2010). The relationship among metacognitions, attentional control, and state anxiety. *Cognitive Behaviour Therapy, 39*(1), 64–71. doi: 10.1080/16506070902991791

Ramirez, G., & Beilock, S. L. (2011). Writing about testing worries boosts exam performance in the classroom. *Science, 331*(6014), 211–213. doi: 10.1126/science.1199427

Shokrpour, N., Zareii, E., Zahedi, S., & Rafatbakhsh, M. (2011). The impact of cognitive and meta-cognitive strategies on test anxiety and students' educational performance. *European Journal of Social Science*, *21*(2), 177–188.

Soysa, C. K., & Weiss, A. (2014). Mediating perceived parenting styles-test anxiety relationships: Academic procrastination and maladaptive perfectionism. *Learning and Individual Differences, 34,* 77–85. doi: 10.1016/j.lindif.2014.05.004

Spada, M. M., Nikcevic, A. V., Moneta, G. B., & Ireson, J. (2006). Metacognition as a mediator of the effect of test anxiety on a surface approach to studying. *Educational Psychology, 26*(5), 615–624. doi: 10.1080/01443410500390673

Stoeber, J., Feast, A. R., & Hayward, J. A. (2009). Self-oriented and socially prescribed perfectionism: Differential relationships with intrinsic and extrinsic motivation and test anxiety. *Personality and Individual Differences, 47*(5), 423–428. doi: 10.1016/j.paid.2009.04.014

Valizade, M., Hasanvandi, S., Mehrabizade Honarmand, M., & Afkar A. (2013). Effectiveness of group metacognitive therapy for metacognitive beliefs and anxiety. *Procedia-Social and Behavioral Sciences*, 84 ,1550–55. doi: 10.1016/j.sbspro.2013.06.787

Weiner, B. A., & Carton, J. S. (2012). Avoidant coping: A mediator of maladaptive perfectionism and test anxiety. *Personality and Individual Differences, 52*(5), 632–636. doi: 10.1016/j.paid.2011.12.009

Wells, A. (1995). Metacognition and Worry: A Cognitive Model of Generalized Anxiety Disorder. *Behavioural and Cognitive Psychotherapy, 23*(3), 301-320. doi: 10.1017/s1352465800015897

Wells, A. (2007). Cognition About Cognition: Metacognitive therapy and change in generalized anxiety disorder and social phobia. *Cognitive and Behavioral Practice, 14*(1), 18–25. doi: 10.1016/j.cbpra.2006.01.005

Wells, A. (2009). *Metacognitive therapy for anxiety and depression*. New York: Guilford Press.

Tajrishi, K. Z., Mohammadkhani, S., & Jadidi, F. (2011). Metacognitive beliefs and negative emotions. *Procedia - Social and Behavioral Sciences,* 30, 530–533. doi: 10.1016/j.sbspro.2011.10.103