Development and Investigation of a Cognitive-Metacognitive Behavioral Model: An Explanation for Hypochondria Disorder

Amir Mohsen Rahnejat[1], Mehdi Rabiei[2], Vahid Donyavi[3], Hasan Shahmiri[3]

[1]Department of Clinical Psychology, AJA University of Medical Science, Tehran, Iran.
[2]Department of Clinical Psychology, Baqiyatallah University of Medical Sciences, Tehran, Iran
[3]Department of Psychiatry, AJA University of Medical Science, Tehran, Iran

Corresponding Author:
Amir Mohsen Rahnejat,
Department of Clinical Psychology,
AJA University of Medical Science,
Tehran,
Iran
E-mail: arahnedjat@yahoo.com

Abstract

Introduction: Hypochondria is a prevalent disorder which is resistant to diagnosis and treatment. The present study has aimed to develop and validate a new behavioral cognitive-metacognitive model, which explains the hypochondria disorder.
Methods: The present research used a descriptive and correlational research method with a structural equations design. In the current study, a comprehensive and detailed definition of hypochondria disorder was suggested and then the conceptual model was proposed. Finally, the model developed with the help of structural equations was tested through the AMOS Graphic software.
Results: Results of the structural equation model indicated that the behavioral cognitive-metacognitive model is capable of explaining the hypochondria disorder. Moreover, the results of the general fit indexes of the structural equations model suggested that the developed model has the goodness of fit indexes with the sample data and is closely related with theoretical hypotheses.
Conclusion: The suggested model in this study had multidimensional focuses on all behavioral-cognitive and metacognitive aspects. Furthermore, the model considered all the three dimensions to be in an interacting relationship (it did not consider them to be separate or conflicting concepts).Therefore, it was considered to be a novel explanatory model. This model might promote future researches regarding hypochondriac disorder and facilitate case formulations and relevant clinical treatments.

Keywords: Modeling, Hypochondria Disorder, Behavior, Cognition, Metacognition

Introduction

Hypochondria is a mental disorder usually diagnosed with an individual's belief that he/she suffers from a serious disease, and his/her concern about it. This belief continues for at least six months despite the lack of pathological findings in medical and neurotic examinations.

Patients with hypochondria suffer from an obsession and fear about having a serious illness. Individuals with hypochondria are obsessed with a feeling that their bodies do not perform normally. Moreover, they think that normal bodily feelings and senses, such as heart beat, sweating, and other partial issues (like allergic rhinitis, simple sore throat or small acnes) are signs of their terrible illness [1].

This disorder can be of various kinds. One such type incorporates individuals who obsessively focus on a particular organ, such as kidneys, or on a particular disease, such as cancer. Despite negative results of medical examinations, individuals with this disorder would continuously seek to recover their health by frequently visiting medical clinics. Instead of visiting a psychologist or psychiatrist, these individuals search for other ways— such as consumption of various drugs and visiting physicians—to cure their physical

diseases. About two third of these individuals suffer from major depression, anxiety disorder, Obsessive-Compulsive Disorder (OCD), and General Anxiety Disorder (GAD).

This disorder is relatively prevalent in about 5.8% individuals, as reported in the 4th edition of the Diagnostic and Statistical Manual of mental disorders (DSM-IV-TR) [2].

The prevalence of this disorder is approximately equal between men and women. However, in some studies, the bodily complains have been reported higher among women. Although hypochondria disorder is often observed among individuals between 20 and 30 years of age, symptoms of this disorder may appear at any age [2]. The complaint rate for hypochondria disorder amongst medicine students was about 3% and it usually appears in the first two years of their education. However, these complaints are generally temporary [3]. .Nevertheless, a study conducted in 2004 on medicine students in their initial four years of education didn't prove this argument [4].

There may be clear relationships between intensification of hypochondria disorder symptoms and psycho-social stressors. This disorder emerges in early years of adulthood, and its symptoms may appear after a loved one becomes seriously ill or after a close friend or a family member dies. Psychological tensions and stress may be contributors as well. Furthermore, when individuals have sufficient and accurate information about a disease, it may affect their interpretation of physical symptoms of a disease in themselves. Meanwhile, any of these cases may trigger "hypochondria" and a series of personality and hereditary moods may make the patient vulnerable. For instance, nervous individuals (self-critical, introvert, and narcissist) are more prone to hypochondria disorders. They believe that being healthy means having no pain or sadness, which may lead patients to wrong conclusions. They might infer that a particular body function is a symptom of disease. These individuals have lower liminal tolerance than others and they therefore perceive some inner feelings that other individuals may not be even aware of [5].

Four theories have been introduced in order to find out the etiology of the hypochondria disorder:

According to the first theory, individuals, owing to their wrong cognitive schema, may focus on their bodily senses, misinterpret them, and consider those as warnings. The second theory, based on the social learningmodel,emphasises on two processes of observation and imitation. According to this theory, having an afflicted relative in the family may be cosidered as a risk factor for hypochondria disorder.

The third theory suggests that this is another variation of mental disorder and is related to depression and anxiety disorders more than any other ailments.Therefore, it is difficult to separate these afflictions from one another.

The fourth theory for hypochondria disorder is based on the psychodynamic approach. According to this approach, aggressive and hostile wishes towards others (through repression and displacement) transform into bodily complaints. According to Freud, accepting a patient's role, in fact, is a shortcut for him/her to avoid annoying commitments and to postpone unpleasant challenges [6]. Depression and anxiety have the highest comorbidity with hypochondria, but depression comprises just a small part of this disorder. Moreover, relating all the symptoms of hypochondria to one disorder from the first axis is a mistake. Patients with hypochondria disorder often seek medical and therapeutic care and are faced with career and social dysfunctions [7].

The model proposed in the present study holds that in addition to the internal and external factors in the above-mentioned approaches, metacognitive factors also interact with behavioral and cognitive factors. In the proposed behavioral-cognitive-metacognitive model, it is believed that the cognitive factor is responsible for initiating the problem. Nevertheless, metacognitive and behavioral factors are required in order to accelerate the problem. In other words, these factors are mutually interdependent and they do not usually act in a separate manner. To get a better understanding of the model, the developed model is described in steps.

In this model, it is believed that negative cognitions come to mind first. This step takes place in the mind of individuals. The presence of negative cognitions (thoughts impulses, and images—which are relatively normal) does not mean presence of disorder. Results of some studies support this idea [8_ 10]. But a question may arise that if negative cognitions do not cause disorder then what factors do?

This question had been answered in the behavioral-cognitive-metacognitive model. The suggested model argues that our attitude and viewpoint towards negative cognitions can increase the level of disorder. For instance, if we have negative attitude (negative metacognitive belief) towards our negative cognitions and consider them as abnormal, after a while they will scare us and we will consider them dangerous. Considering negative cognitions as dangerous and threatening, leads to meta-worry. Many individuals may be in constant worry. However, meta-worry is more serious and usually does lead individuals towards ailments. In this model, it is held that harboring negative beliefs towards negative cognitions leads to meta-worry. It is after experiencing meta-worry that individuals decide to get rid of negative cognitions in any ways possible. In this stage, individuals use thought control strategies and compulsive behaviors, such as hyper-checking of disease and repeating disease-related tests (which is solely in their mind) in order to decrease their meta-worry.

Thought control strategies include strategies which are used for controlling and eliminating negative thoughts and cognitions. Examples of these strategies include repression distraction, and elimination. Attempting to control and eliminate negative cognitions exacerbates negative cognitions, instead of eliminating them. Therefore, these strategies often lead to failure. In addition to thought control strategies, individuals also employ compulsive and safety behaviors in order to

diminish their meta-worry. These obsessive-compulsive behaviors temporarily induce a feeling of satisfaction and peace in the patient. However, in long terms, this leads to a vicious cycle.

Reviewing research literature indicates that different models had been proposed for explaining hypochondria. But most of these models are either unable to explain and predict hypochondria or they are not holistic and multi-dimensional in explaining this disorder. The introduced model in the present research was developed in order to compensate a part of these deficiencies. The aim of the present study is to investigate and validate behavioral cognitive-metacognitive model for explaining hypochondria.

Methods

The present study used a descriptive-correlative research method. The study population consisted of all outpatients with hypochondria in Isfahan, Iran in 2013-2014. The research sample was selected from counseling centers and medical clinics via the cluster sampling method. In order to determine the sample size, Cochran's sample size estimation method was used. Since the real size of population (N) was unknown in the present research, the standard deviation (S) was also unknown and untraceable. Therefore, the square of standard deviation formula was used in order to estimate the statistical sample size. Since the standard deviation of the sample(S) was unknown, it would be estimated by selecting a number of statistical samples, which preferably shouldn't be less than 30 subjects [11]. Therefore, in order to determine the sample size, first 40 subjects were selected as sample. The obtained variance from the first sample was substituted in the following equation. Results suggested that a sample consisting of 600 subjects would be sufficient and desirable for the present study. However, in order to ensure that there would not be any deficiency in the sample size (in case the sample got lost and problems in completion of the questionnaire arose), 640 individuals were selected as sample. Five subjects were omitted from the sample due to imperfect completion of the questionnaire, and finally the data for 635 subjects were analyzed. The following were the inclusion criteria: diploma as the minimum education level, not being hospitalized, should be Isfahan speaking Farsi, should be within 15-50 years of age, and should have full consent and cooperation with the study. Subjects without the above criteria were excluded from the study.

Health Anxiety Inventory—Short Form: An 18-item self-rate scale was devised for assessing health anxiety/hypochondria symptoms. This scale specifically measures the presence of worries and mental distress about health in individuals. Participants answered the questions in a four-rate scale (ranging from absolutely true to absolutely untrue, that is, 0 to 54). High scores indicated the high intensity of symptoms and disease. Salkovskis et al. [12] reported that this scale has a desirable reliability and validity for identifying health anxiety. In Iran, Rabiei et al. [13 showed that the scale has

an appropriate reliability and validity on an Iranian sample.

Cognitive Distortion Scale (CDS): This scale measured cognitive distortions, which included: (a) self-criticism, (b) helplessness, (c) hopelessness, and (d) obsession with danger and bad events. This scale consisted of 40 items. The participants were asked to rate their answers according to a five-point- scale (from completely true to completely untrue). The score range for each participant varied from 0 to 200. The Cronbach`s Alfa was reported to be higher than 0.97 [14]. The reliability and validity of this scale was calculated in the present research. Results suggested that the cognition distortion questionnaire was reliable (convergence and divergence) and valid (Cronbach`s Alpha) in an Iranian sample.

Dysfunctional Attitude Scale (DAS): This was a self-report scale, which was introduced by Weismann and Beck [15] for assessing attitude schemas and negative beliefs. This scale was one of the most famous measures in the cognitive research field, which includes 40 items. Its rates were based on a 7-point Likert scale. This scale assessed core and intermediate beliefs. By using Cronbach`s Alpha and retest methods, reliability coefficients of this scale were reported to be 0.9 and 0.73, respectively. This scale included four fundamental factors—perfectionism, need for others' approval, need for satisfying others, and vulnerability-performance evaluation.

Automatic Thoughts Questionnaire: This 30-item questionnaire measured the frequency of negative automatic thoughts [16]. It consisted of 30 negative statements about self, and individuals were asked to determine their experience of thoughts over the past week. The scoring was conducted on a Likert spectrum, ranging from 1 (never) to 5 (all the time). The reliability (internal consistency and retest methods) had been calculated higher than 0.8 [17].

Metacognition Questionnaire: The short form of metacognition questionnaire had been revised for measuring metacognitive beliefs [18]. The questionnaire consisted of 30 items and each subject answered the items by choosing from among the four option provided (disagree, approximately agree, averagely agree, and completely agree). These options were provided with scores 1, 2, 3, and 4, respectively. The short form of metacognition questionnaire assessed five components—cognitive confidence, positive worry belief, cognitive self-awareness, negative belief about uncontrollability, and danger and beliefs about need for control. Cronbach`s alpha coefficients of this questionnaire and its components ranged from 0.72 to 0.93. The retest reliability coefficient of the short form questionnaire is 0.73.

Obsessive-Compulsive Behavior Scale: It was an 8-item self-rate test, which measured problematic behaviors in obsessive-compulsive disorders. This researcher-made test was scored on the 5-point Likert scale, from 0 to 4.It included dimensions of safety, neutralization behaviors, avoidant behaviors, and obsessive behaviors. Psychometric properties of this scale were obtained in the present research. The Cronbach's alpha and retest

coefficients (with a three-week interval) were 0.87 and 0.81, respectively. Moreover, this test had desirable content reliability and formal reliability. Investigation of construct validity, by discovering factors analysis with final Varimax rotation (at three weeks interval), indicated that the four factors—safety behaviors, neutralizing behaviors, avoidant behaviors, and obsessive behaviors—explained 67% of variance in the scale [13].

In the present research, descriptive statistical correlation regression and structural equations modeling—via SPSS and AMOS—were used to investigate the hypothesis and validate the developed model. Pearson's correlation and multiple regressions methods were used to examine the correlational hypotheses. Total fitness indexes parsimonious, model indexes, and comparative indexes were used to investigate the goodness of fitness in the proposed model.

In line with ethical considerations, the participants were informed that the research intends to investigate and validate a new therapeutic model on obsessive symptoms. Participants were also assured that their information would remain completely confidential. Furthermore, they were assured that the research results would be published statistically and the conclusion would be general (not individual).Moreover, they had full authority to refuse participation in the study or quit the research at any phase if they wished to.

Results

In order to investigate and validate the model, the AMOS Graphic software was used for the structural equations model. The research objectives were described by presenting the model and its conceptual explanations in this section. Furthermore, standard model coefficients and fit index of the model were presented in order to assess the validity of the model.

As shown in Figure 1, core beliefs affected cognitive distortion through the mediation of intermediate beliefs (rules, assumptions, and attitudes). Positive metacognitive beliefs affected negative automatic thoughts and increased them through the mediation of cognitive distortions. Likewise, intermediate beliefs influenced negative automatic thoughts and increased them through the mediation of cognitive distortions. Moreover, cognitive distortions influenced meta-worry and increased it through mediation of negative automatic thoughts. Furthermore, negative automatic thoughts boosted thought control strategies through the mediation of meta-worries. Also, negative automatic thoughts influenced and increased obsessive behaviors via the mediation of meta-worries. Finally, meta-worries and thought control strategies affected the hypochondria disease through the mediation of obsessive behaviors.
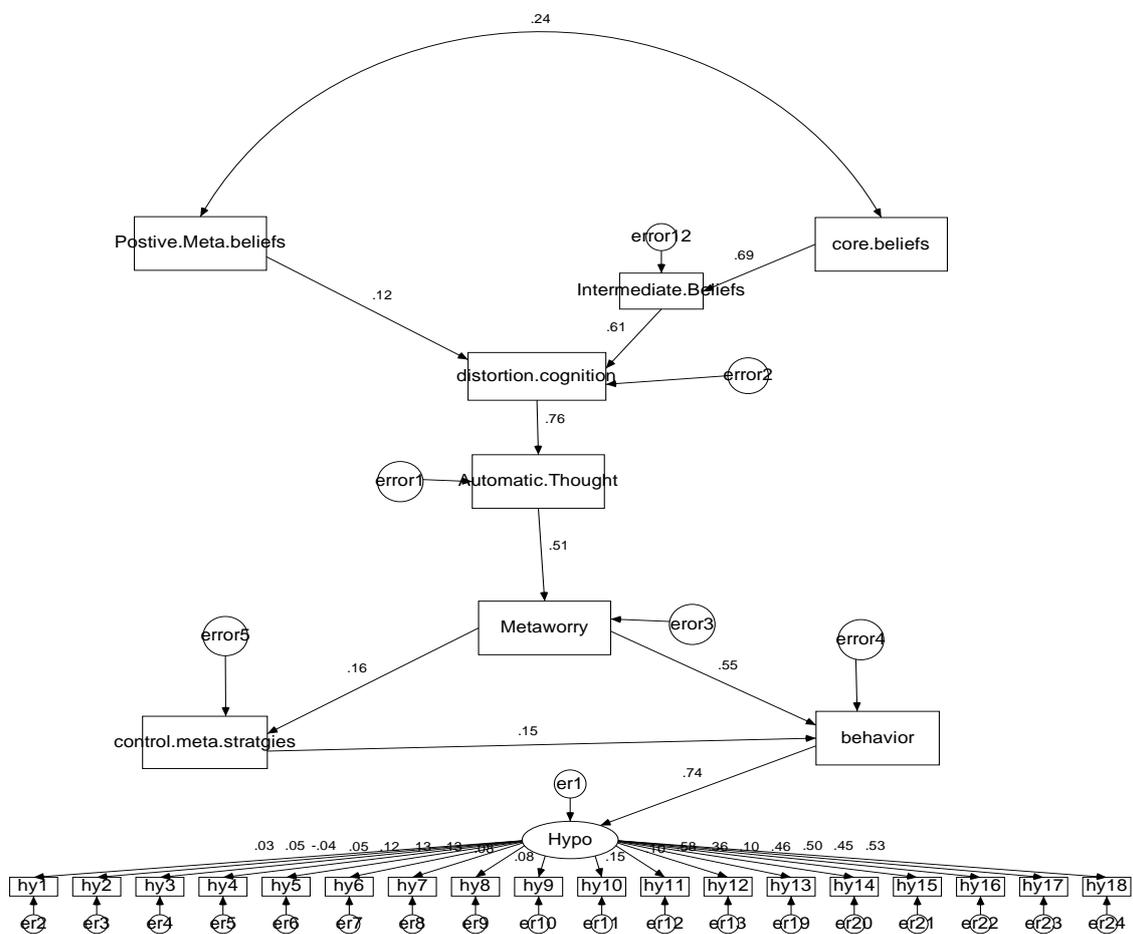

Figure 1. Conceptual model of the whole research and its standard coefficients

Table 1. Assumed Fit Indexes of the model, according to Figure 1

RMSEA	RMR	TLI	GFI	CFI	AGFI
0.033	0.03	0.9	0.89	0.9	0.92

In the above model, the value of X^2 was not significant after modification ($X^2=1.33$ and $P=0.11$).It revealed that the model was acceptable. The Root Mean Square Error of Approximation (RMSEA) (which was another fit index of the model equaling 0.03) showed that the model has the goodness of being fit. Also, the resulted Comparative Fit Index and Tucker Lewis Index values were higher than 0.9, which confirms the model. Parsimonious Fit Indexes were not presented in the above table. However, the Parsimony Comparative Fit Index (PCFI) and Parsimony Normed Fit Index equaled 0.80 and 0.76, respectively. This increased the conformity of the model. The value of p-close was 0.13(higher than 0.10 values, which were desirable).

Discussion

The present study was conducted with the aim of investigating and validating a behavioral-cognitive-metacognitive model for explaining hypochondria.

In order to achieve this, the desired model was developed and tested in terms of reliability and validity. The model was designed based on theoretical and research literature, and also the clinical experiences of the authors. In this model, behavioral components (avoidant obsessive-compulsive, and safety behaviors), cognitive (core beliefs, intermediate beliefs, and automatic thoughts), and metacognition (positive/negative metacognitive beliefs and metacognitive strategies) were addressed for explaining the hypochondria disorder. The findings of the current research are consistent with the results of the relationship between cognitive components and hypochondria. This relationship might be caused by these patients' underlying beliefs, which were too general, pervasive, inflexible, strict, negative, and irrational. This led the brain to be accompanied by cognitive distortion and finally led to an increase in negative automatic thoughts among these patients. This finding was consistent with the findings of Wells [19] and Wells and King [20]. All these studies concluded that positive beliefs led to an increase in negative thoughts. However, Wells et al. did not mention that metacognitive components interacted with cognitive and behavioral factors and effected emotional disorders, such as obsessive-compulsive disorder. Moreover, the present findings are consistent with the results of the relationship between behavioral components and hypochondria [4_ 5]. It can be concluded that obsessive avoidant safety and neutralizing behaviors in these patients led to the problem. General, pervasive, inflexible, strict, negative, and irrational underlying beliefs and problematic metacognitive beliefs would not be modified. Therefore, they would help the patients to maintain normal mental processes and exacerbate their cognitive distortion and negative automatic thoughts.

The cognitive behavior therapy approach only concentrated on cognitive and behavioral aspects and did not focus on metacognitive dimensions, such as meta-worry and thoughts control strategies. Therefore, it can be concluded that this therapy was deficient and incomplete. The metacognitive approach, on the other hand, just pays attention to the processual aspects and puts less emphasis on the importance of cognitive (core beliefs, intermediate beliefs, cognitive distortions, and negative automatic thoughts) and behavioral dimensions. Therefore, it is opaque and deficient as well. The developed model of the present research heeds to behavioral cognitive and metacognitive aspects, simultaneously. From the perspective of this approach and model, these three dimensions were considered as mutually interdependent and helped in the emergence and persistence of the hypochondria disorder. As shown in this model, cognitive factors—such as core beliefs and negative automatic thoughts—would elevate worry, followed by an increase in meta-worries. This factor would increase obsessive-compulsive behaviors and thought control strategies. Cognitive perspective believes that cognitive factors can solely cause this disorder.

Conclusion

The developed model of the current research held that problematic negative cognitions increased meta-worries. Meta-worry occurred when patients' negative cognitions gave rise to fear and labeled them abnormal, considering them to be specific to their own mind. Wells believed that when patients fear from their own thoughts, and when they call these thoughts abnormal and uncontrollable, they get more frightened and desperately try to eliminate and control them [19]. Their efforts for controlling and elimination of negative thoughts fail to diminish these thoughts and negative impulses. Moreover, they also lead to a failure in controlling thoughts and sometimes even to an increase in negative thoughts. When an individual gets frustrated in controlling negative thoughts, he/she tries obsessive-compulsive avoidant and behaves in a way that decreases his/her anxiety and tension. Obsessive-compulsive and avoidant behaviors temporarily reduce anxiety and this reinforces the individual to repeat obsessive-compulsive behaviors repeatedly. However, in the long term, obsessive-compulsive behavior becomes persistent and, as a result, the disorder becomes chronic [21-23].Therefore, behavioral cognitive and metacognitive aspects and their interactions have been focused on in order to explain hypochondria from the perspective of the developed model of the present research.

Among the limitations of the present study the following points can be mentioned:

First, the developed model addressed only behavioral cognitive and metacognitive dimensions and other dimensions—such as biological, socio-local family, economic, spiritual, and other factors—were not emphasized. Only nonclinical and general participants were selected for developing the model. Furthermore, the utilized method was correlational and not causative-comparative. The present research has been conducted on nonclinical population. Hence, it is necessary to

examine the present model in longitudinal and experiential studies on obsessive-compulsive patients (quantitatively and qualitatively).It is also recommended that this model should-be compared with other existing models, if possible.

Acknowledgement

References

1. American Psychiatric Association. Diagnostic and Statistical Manual of Mental Disorders (4th Edition) Text Revision. Washington DC: Author2000.

2. Sadock BJ, Sadock VA. Comprehensive Textbook of Psychiatry; 8th ed. Lippincott, Williams and Wilkins 2005: 1810.

3. Marcus DK, Gurley JR, Marchi MM, Bauer C. Cognitive and perceptual variables in hypochondriasis and health anxiety: a systematic review. Clin Psychol Rev 2007 Mar;27(2):127-39.

4. Creed F. Should general psychiatry ignore somatization and hypochondriasis? World Psychiatry 2006 Oct;5(3):146-50.

5. Hiller W, Leibbrand R, Rief W, Fichter MM. Predictors of course and outcome in hypochondriasis after cognitive-behavioral treatment. Psychother Psychosom 2002 Nov;71(6):318-25.

6. Noyes R, Jr., Stuart SP, Langbehn DR, Happel RL, Longley SL, Muller BA, et al. Test of an interpersonal model of hypochondriasis. Psychosom Med 2003 Mar;65(2):292-300.

7. Creed F, Barsky A. A systematic review of the epidemiology of somatization disorder and hypochondriasis. J Psychosom Res 2004 Apr;56(4):391-408.

8. Clark D, Beck A. cognitive therapy of anxiety disorders. THE GUILFORD PRESS, New York London 2010.

9. Beck AT. Cognitive therapy and the emotional disorders. New York: International Universities Press1976.

10. Purdon C, & Clark DA. Obsessive intrusive thoughts in nonclinical subjects. Part I. Content and relation with depressive, anxious and obsessional symptoms. Behavior Research and Therapy1993, 31, 713–720.

11. Ker linger F N, & Lee HB. Foundations of behavioral research (4thed.). Holt, NY: Harcourt College Publishers 2000.

12. SALKOVSKIS PM, RIMES KA, WARWICK, HMC, and CLARK, DM.(2002). The Health Anxiety Inventory: development and validation of scales for the measurement of health anxiety and hypochondriasis. Psychological Medicine, 2002, 32, 843-853.

13. Rabiei M. Development of a causal behavioral-cognitive-metacognitive model for explaining the class of obsessive-compulsive disorders and the effect of intervention based on the model on severity of the symptoms of obsessive-compulsive disorders. Ph.D Thesis, University of Isfahan2013.

14. Briere J. The cognitive distortion scale professional manual. Odessa, FL: Psychological Assessment Resources 2000.

15. Weismann AN, & Beck AT. Development and validation of the dysfunctional attitude scale: A preliminary investigation. Paper presented at the Annual Meeting of the American Educational Research Association, Toronto, Ontario 1978.

16. Holon SD, & Kendall PC. Cognitive self-statements in depression: Development of an Automatic Thoughts Questionnaire. Cognitive Therapy and Research1980, 4, 383-395.

17. Ghasemzadeh H, Mojtabaei R, Karamghadiri N, Ebrahimkhani N. Psychometric properties of a Persian-language version of the Beck Depression Inventory--Second edition: BDI-II-PERSIAN. Depression and anxiety2005; 21(4):185-92.

18. Cartwright-Hatton S, Mather A, Illingworth V, Brocki J, HarringtonR, & Wells A. Development and preliminary validation of the Meta-cognitions Questionnaire—Adolescent version. Journal of Anxiety Disorders2004, 18, 411–422.

19. Wells A. Metacognitive therapy for anxiety and depression. New York: Guilford Press 2009.

20. Wells A, & King P. Metacognitive therapy for generalize anxiety disorder: an open trail. Journal of Behavior Therapy and Experimental Psychiatry2006, 37, 206-212.

21. Rabiei M, Mulkens S, Kalantari M, Molavi H, Bahrami F. Metacognitive therapy for body dysmorphic disorder patients in Iran: acceptability and proof of concept. Journal of behavior therapy and experimental psychiatry. 2012 Jun;43(2):724-9. PubMed PMID: 22080870. Epub 2011/11/15. Eng

22. Rabiei M, MT. Goldoz-Khayat, N. The effectiveness of metacognitive-cognitive-behavioral intervention on severity of the symptoms of hair pulling disorder Journal of Behavioral Sciences. 2014;7(4):8-373,(persain).

23. Rabiei M, Salahian A, Bahrami F, Palahang H. Construction and Standardization of the Body Dysmorphic Metacognition Questionnaire J Mazandaran Univ Med Sci 2011;21(83):43-52,(persain).