

The Relationship between Scrupulosity, Obsessive-Compulsive Disorder and Its Related Cognitive Styles

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ABSTRACT

Objective: This research aimed to study the relationship between scrupulosity and obsessive-compulsive symptoms as well as obsessive-compulsive-related cognitive styles (obsessive beliefs and thought-action fusion).

Methods: This was a correlational study. The study population included all individuals who referred to counseling centers of Tehran from August to December 2010 and diagnosed with obsessive-compulsive disorder, and also all Persian speakers with OCD who were active in internet from August to November 2012. A total of 30 individuals with obsessive-compulsive disorder (mostly Iranian Muslims) were recruited from different psychological counseling centers in Tehran. In addition, 50 individuals with OCD (obsessive-compulsive disorder) were recruited via internet social networks. For screening, we used Obsessive-Compulsive Inventory-Revised (OCI-R). Convenience method was used for the sampling. In order to collect data, Penn Inventory of Scrupulosity (PIOS), Thought-Action Fusion Scale (TAF), Depression Anxiety Stress Scale (DASS-21), Obsessive-Compulsive Inventory-Revised (OCI-R), and Obsessive Beliefs Questionnaire (OBQ) were administered. Pearson correlation coefficient and regression analysis were used to analyze the data. SPSS version 18 was used for data analysis.

Results: Results showed that there were significant relationships between scrupulosity and obsessive-compulsive symptoms total score ($r=0.275$, $P<0.05$); also scrupulosity and obsessive beliefs ($r=0.558$, $P<0.01$); and scrupulosity and thought-action fusion ($r=0.506$, $P<0.01$). Results also revealed that the variations in scrupulosity scores could be best predicted by 'anxiety' and 'Importance and Control of Thoughts.' Scrupulosity is a subtype of OCD and is obsessive in nature.

Conclusion: As explained by cognitive-behavioral theories of religious OCD, scrupulosity is closely related to the 'Importance of Thoughts and Controlling Thoughts,' as well as moral and probability 'Thought-action Fusion.' The results were in accordance with the findings of comparable studies on Christian samples. Results were explained according to Islamic views, and the implications for research and practice were discussed.

1. Introduction

Scrupulosity is a mental disorder characterized by obsessions or excessive guilt associated with religious or ethical issues, which is often accompanied by religious or ethical

compulsive acts and is highly distressing and maladaptive (Abramowitz, Huppert, Cohen, Tolin, and Cahill, 2002). Scrupulosity and Obsessive-Compulsive Disorder (OCD) have many common features and in fact, scrupulosity is often regarded as the religious subtype of obsessive-compulsive disorder (Abramowitz et al., 2002).

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Epidemiological studies have shown different results regarding the prevalence of scrupulosity among those who suffer from OCD, ranging from 5% to 33% in Western countries (Miller and Hedges, 2008; Mataix-Coles, Marks, Greist, Cobak, and Baer, 2002). In Iran, Dadfar, Bolhari, Malakouti, and Bayanzadeh (2001) reported that 64% of an OCD sample also suffered from contamination obsessions and compulsions. In addition, 23% and 28% of the sample were reported to have mental obsessions about moral issues and blasphemy (Dadfar et al., 2001). On one hand, scrupulosity is related to mental health area of expertise and on the other hand, it is highly related to religion, and involves religious clergy. This is an ethical and professional challenge to experts and requires a new consideration of different aspects of scrupulosity.

There has been a debate among OCD-experts regarding clinical versus non-clinical nature of scrupulosity. Scrupulosity, in its milder forms, is often observed in general population and a majority of scrupulous individuals do not suffer from OCD (Abramowitz and Jacoby, 2014). Some researchers (for instance, Miller and Hedges, 2008) suggest that scrupulosity should be regarded as a normative phenomenon different from OCD. However, there is a vast body of evidence showing that scrupulosity shares a great deal with OCD pathology and its different symptoms. Some studies suggest that scrupulosity is related to obsessive symptoms of OCD.

For instance, factor analytical studies on OCD symptoms have shown that sexual and religious OCD loaded on a factor commonly referred to as 'pure obsessions' or 'primary obsessions' (Dunne, 2000; Tek and Ulug, 2001). This shows that scrupulosity is obsessive-based and is not associated with compulsive act. With regard to scrupulosity and obsessive OCD symptoms, some investigations have showed a relationship between scrupulosity and obsessions (Nelson et al., 2006; Olatunji, Abramowitz, Williams, Conelly, and Lohr, 2007) also scrupulosity and obsessive doubts (Abramowitz et al., 2002; Warshowsky, 2006). However, scrupulosity has been demonstrated to be related with act-based OCD symptoms, for instance, with compulsive checking (Abramowitz et al., 2002; Warshowsky, 2006) and compulsive neutralizing (Warshowsky, 2006). Thus, it is not clear which kind of symptoms are more relevant to scrupulosity.

Some cognitive-behavioral theories of OCD have emphasized the role of ethical norms and beliefs in its etiology and maintenance. For example, Salkovskis's cognitive-behavioral theory (1985) and Rachman's cognitive theory (1997, 1998, 2003) proposed that when intrusive thoughts about harm occur, healthy individuals perceive

them as meaningless and forget them, while individuals with OCD perceive them as threatening to themselves and others. Salkivskis (1985) and Rachman (1997, 1998, 2003) stated that some general beliefs about contents of thoughts and their implications have a role in etiology and maintenance of OCD, among which, ethical and religious beliefs are important. For instance, an individual who believes in 'sin by thought' might assume that it is sinful to have intrusive thoughts. In fact, 'sin by thought' is a form of moral thought-action fusion, a belief which is based on the assumption that thinking about an immoral action is ethically equivalent and comparable to acting on that particular thought (Rachman, 2003). A firm belief in 'sin by thought' could instill an immense guilt in scrupulous believers, so they would resort to all kinds of neutralizing mental strategies such as repetition of verses and prayers, neutralizing bad thoughts by good ones, and so on (Salkivskis, 1985; Rachman, 1997, 1998, 2003). Moral thought-action fusion has been demonstrated to be positively correlated with scrupulosity (Warshowsly, 2006; Nelson, Abramowitz, Whiteside, and Deacon, 2006).

Despite its high prevalence, scrupulosity is rarely studied cross-culturally. In this regard, investigators have tried to shed a light on different dimensions of scrupulosity by identifying the OCD-associates related to scrupulosity, which include obsessive-compulsive symptoms and OCD-related cognitive styles. This would help researchers to understand how scrupulosity is developed and how to design effective therapeutic strategies for this condition. Since scrupulosity is influenced by cultural and religious beliefs, researchers have also attempted to investigate the relationship between scrupulosity and OCD-associates within different cultures.

Some studies investigated the relation of scrupulosity to OCD-related cognitive styles. For instance, Warshowsly (2006) suggested that there was a strong relationship between scrupulosity and obsessive beliefs, moral thought-action fusion, and likelihood thought-action fusion (a belief based on the assumption that thinking about a negative event would increase the probability of occurring it).

Witzig (2005) demonstrated a moderate relationship between scrupulosity and 3 subscales of obsessive belief questionnaire. Nelson et al., (2006) observed that scrupulosity had a moderate relationship with moral thought-action fusion, and 3 subscales of interpretation of intrusions inventory. Gonsalvez, Hains, and Stoyles (2010) demonstrated that obsessive beliefs and level of religiosity could significantly predict variability of scrupulosity scores. Fergus and Rowatt (2015) showed that fear of uncertainty plays a crucial role in scrupulosity, particularly in fear of

sin. Fergus and Valentiner (2012) highlighted the role of perfectionist tendencies and compulsive checking for mistakes in scrupulosity.

These findings show that scrupulosity is related to a rage of OCD-related cognitive styles. However, it is not clear which cognitions are specifically more related to scrupulosity. In addition, since the above mentioned investigations used Christian samples, their findings should be cautiously generalized to Muslim populations. In the only published study on Muslim scrupulosity, Inozu, Clark, and Karanci (2012) compared scrupulosity between two groups of highly and lowly religious Muslims (Turkish) and Christians (Canadian). Results showed that in both groups the obsession subscale of Clark-Beck Obsessive-Compulsive questionnaire and all subscales of obsessive belief questionnaire were strongly correlated with scrupulosity. Nevertheless, more studies are warranted to investigate scrupulosity and OCD-related cognitive styles using Muslim samples.

Since relevant findings are inconsistent, more investigations are needed to determine different aspects of scrupulosity and their relationship with obsessive-compulsive symptoms and OCD-related cognitive styles. In addition, scrupulosity has not been well studied in Muslim populations which warrants more investigations. Furthermore, most studies on scrupulosity used non-clinical samples, thus there are very limited findings regarding scrupulosity in OCD population. The present study is the first of its kind to investigate scrupulosity in a clinical sample of Muslims with OCD in Iran.

In addition, this study addresses different aspects of thought-action fusion in Muslims with regard to existing theories, which has rarely been investigated. Besides, symptomatic structure of scrupulosity has not been studied in Muslim samples, which is addressed by the present research. This study aimed to investigate the association of scrupulosity with obsessive-compulsive symptoms and OCD-related cognitive styles (obsessive beliefs and thought-action fusion).

2. Methods

We used a correlational method to investigate the relationship among variables of the study. Regression analysis was also used to determine share of obsessive-compulsive symptoms and OCD-related cognitive styles on variability of scrupulosity.

The study population included all individuals who referred to counseling centers of Tehran from August to De-

cember 2010 and diagnosed with obsessive-compulsive disorder, and also all Persian speakers with OCD who were active in internet from August to November 2012. Convenience method was used for sampling. It was conducted in 2 phases:

Phase 1: from clinics and counseling centers of Tehran, August to December 2010.

Phase 2: from internet social networks (Persian speakers only), August to November 2012.

This study was approved by the Ethics Committee of Allameh Tabatabaei University, School of Psychology. During phase 1, recruitment was done from Shafa counseling center, Aramesh counseling center, and the Child and Family Clinic of Shahid Beheshti University. Those clients diagnosed with OCD by the clinical psychologists of the counseling centers, were offered to participate in the research. Before data collection, participants became aware of the research aims and processes, and signed the consent forms. Then participants were asked to answer the questionnaires including demographic questionnaire, Obsessive-Compulsive Inventory-Revised (OCI-R), Penn Inventory of Scrupulosity (PIOS), Obsessive Beliefs Questionnaire-44 (OBQ-44), Thought-Action Fusion (TAF), and Depression Anxiety Stress Scale (DASS-21). To avoid fatigue and reduction in motivation, data collection from some participants was conducted in 2 days. During phase 2, participants completed online versions of the instruments and consent forms which were put on Iranian psychology pages of Facebook on the Web. This internet survey operated for 4 months. Only respondents who met full inclusion criteria were participated in the research.

Inclusion criteria were: 1. Literacy; 2. Voluntary participation; 3. Diagnosis of OCD, made by clinical psychologist (this was for the participants of the clinic sampling; participants of the internet sampling were asked if they had ever received a diagnosis of OCD); 4. A score of 18 or above in Obsessive-Compulsive Inventory-Revised (OCI-R), or a score of 5 or above in obsessing subscale of OCI-R. Participants with co-morbid disorders were included in the study, and depression and anxiety were measured.

During sampling, 125 individuals were assessed, 46 in phase 1, and 79 in phase 2. A total of 30 individuals in phase 1 and 50 individuals in phase 2 met the inclusion criteria (80 in total) and were analyzed for the purpose of this study. About 29% of the participants were male and 71% female, with an average age and standard deviation of 20.69 and 6.845. Around 68.8% of the sample was Muslim, 1.3% Zaratustrian, and 20% followed no particu-

lar religion. About 60% of participants had received no pharmacotherapy for OCD, while 40% of them had been on pharmacotherapy before. Around 29% of participants had been on psychotherapy for OCD, and 71% of them had never received psychotherapy. Final data analysis and manuscript preparation were completed in 2013.

Instruments

Demographic Questionnaire

This questionnaire was designed by the researcher to assess the demographic data, including sex, age, marital status, education, religion, risk at work, psychological disorders, and history of pharmacotherapy or psychotherapy for psychological disorders.

Obsessive-Compulsive Inventory-Revised (OCI-R)

OCI-R was originally developed by Foa, Huppert, Leiberg, Langner, Kichic, and Hajcak et al. (2002). It has 18 items and assesses heterogeneous symptoms of OCD in clinical and subclinical populations. It has 6 subscales: washing, checking, obsessing, neutralizing, hoarding, and ordering, each assessed by 3 items. Answers are scored on a 5-point Likert scale, ranging from 0 (never) to 4 (too much). Foa et al. (2002) reported a good reliability for OCI-R, as 0.81 to 0.93 for the whole items and 0.65 to 0.90 for its subscales.

Test-retest reliability was good (0.57 to 0.91) and convergent and divergent validity were sufficient. Farsi version of OCI-R was developed by Mohammadi, Zamani, and Fata (2008) and psychometric its properties were assessed. Reliability was assessed using Cronbach α , which was 0.85 for whole items and 0.66 for checking, 0.69 for ordering, 0.72 for obsessing, 0.69 for washing, 0.72 for hoarding, and 0.50 for neutralizing. Pearson r for subscales and whole items were 0.61 to 0.80. In general, psychometric properties of Farsi version of OCI-R were comparable to the English version.

Penn Inventory of Scrupulosity (PIOS)

PIOS was developed by Abramowitz et al. (2002). This 19-item-scale assesses scrupulosity symptoms and has 2 subscales: 'fear of sin' and 'fear of God.' Answers are scored on a 5-point Likert scale, ranging from 0 (never) to 4 (always). According to Abramowitz et al. (2002), it has a good internal consistency, with the Cronbach α coefficients of 0.90, 0.88, and 0.93 for fear of sin, fear of God, and the whole items, respectively. PIOS is strongly correlated with (Maudsley Obsessive Compulsive Inventory) MOCI

($r=0.36$, $P<0.01$) which indicates a good convergent validity. There was no correlation between PIOS and anger expression inventory, indicating a good divergent validity. PIOS was translated to Farsi by the author and a translator of psychology texts, and approved by 3 university professors in clinical psychology. Cronbach α coefficients were 0.88, 0.90, and 0.97 for 'fear of sin,' 'fear of God,' and the whole items, respectively.

Obsessive Beliefs Questionnaire-44 (OBQ-44)

OBQ-44 was developed by Obsessive Compulsive Cognitions Working Group (2003, 2005). This 44-item questionnaire assesses dimensions of pathogenesis in cognitive domain among those with OCD. Answers are scored on a 7-point Likert scale, ranging from -3 (strongly agree) to 3 (strongly disagree). OBQ-44 assesses 6 key cognitions in OCD domain. OBQ-44 subscales are 'responsibility and overestimation of threat' (16 items), 'importance of thoughts and control of thoughts' (16 items), and 'perfectionism and intolerance of uncertainty' (12 items). Obsessive Compulsive Cognitions Working Group (2005) showed that OBQ-44 had a good reliability.

Cronbach α coefficients demonstrated good internal consistency (0.93 for responsibility and overestimation of threat and perfectionism and intolerance of uncertainty, 0.89 for importance of thoughts and control of thoughts, and 0.95 for the whole items). OBQ-44 had a good convergent validity and a weaker divergent validity.

Shams, Karamghadiri, Esmaeilitarkanbouri, and Ebrahimkhani (2004) developed the Farsi version of OBQ-44. They reported Cronbach α coefficients of 0.86, 0.84, 0.80, and 0.94 for 'responsibility and overestimation of threat,' 'perfectionism and intolerance of uncertainty,' 'importance of thoughts and control of thoughts,' and the whole items, respectively. Cronbach α coefficient of 0.84 showed good test-retest reliability for the whole items in a 2-week interval. Correlation coefficients with OCI-R and MOCI were 0.57 and 0.50, respectively.

Thought-Action Fusion (TAF)

TAF is a 19-item-scale which was developed by Shafran, Thordarson, and Rachman, (1996). It assesses thought-action fusion and has 3 subscales: moral thought-action fusion (12 items), probability thought-action fusion for others (4 items) and probability thought-action fusion for self (3 items). Answers are scored on a 5-point Likert scale, ranging from 0 (strongly disagree) to 4 (strongly agree). Shafran et al. (1996) reported a good internal consistency

with Cronbach α coefficients of 0.85 and 0.96 for moral and probability thought-actions. They also showed that there was a good test-retest reliability in a 3-month-interval for moral TAF, probability TAF for others, probability TAF for self, and the whole items with Cronbach α coefficients of 0.54, 0.47, 0.53, and 0.52, respectively. There was a correlation between TAF and subscales and Padua Inventory (PI), ranging from 0.26 to 0.32 ($P < 0.01$). PIOS was translated to Farsi by the author and a translator of psychology texts, and was approved by 3 university professors in clinical psychology. Its Cronbach α coefficients were 0.91, 0.91, 0.84, and 0.36 for moral TAF, probability TAF for self, probability TAF for others, and the whole, respectively.

Depression Anxiety Stress Scale (DASS-21)

DASS-21 was developed by Lovibond and Lovibond (1995). It is a 42-item scale, which assesses severity of depression, anxiety, and stress main symptoms. Its brief form with 21 items was implemented in this study. DASS-21 has depression, anxiety, and stress subscales, 7 items for each. Answers are scored on a 4-point Likert scale, ranging from 0 (never) to 3 (very much). Initial investigations showed a good convergent and discriminate validity (Lovibond and Lovibond, 1995). DASS-21 strongly correlated with Beck Anxiety Inventory ($r = 0.81$) and Beck Depression Inventory ($r = 0.74$). Using a non-clinical sample, Lovibond and Lovibond (1995) demonstrated Cronbach α coefficients of 0.91,

Table 1. Pearson correlations between scrupulosity, OCD symptoms, obsessive beliefs, and thought-action fusion.

	Mean	SD	Scrupulosity total score	Fear of sin	Fear of god
Scrupulosity total score	32.34	17.904	-	0.959**	0.895**
Fear of sin	22.98	11.702	0.959**	-	0.731**
Fear of god	9.36	7.468	0.895**	0.731**	-
Depression anxiety stress total score	29.93	11.787	0.389**	0.468**	0.199**
Anxiety	7.50	4.847	0.401*	0.468**	0.227*
Depression	9.68	5.243	0.325**	0.379**	0.186
Stress	12.75	3.716	0.262*	0.351**	0.077
OCD Total score	28.35	12.511	0.275*	0.306**	0.180
Hoarding	4.64	2.909	0.006	0.085	-0.120
Checking	3.68	3.133	0.110	0.132	0.056
Ordering	5.66	3.446	0.121	0.144	0.065
Neutralizing	2.89	3.257	0.242*	0.248*	0.0193
Washing	4.49	3.438	0.239*	0.175	0.300**
Obsessing	7.00	3.056	0.345**	0.414**	0.177
Obsessive beliefs total score	196.15	44.75223	0.558**	0.622**	0.363**
Responsibility and threat	69.0375	18.63741	0.414**	0.488**	0.227*
Perfectionism and certainty	78.05	17.24206	0.408**	0.449**	0.274*
Importance of thoughts and controlling thoughts	49.0625	15.70322	0.651**	0.700**	0.465**
Thought-action fusion total score	38.40	13.196	0.506**	0.500**	0.430**
Moral thought-action fusion	25.41	9.09	0.463**	0.431**	0.434**
Probability thought-action fusion for others	6.65	4.821	0.349**	0.376**	0.247*
Probability thought-action fusion for self	6.34	3.420	0.231*	0.231*	0.157

* $P < 0.05$, ** $P < 0.01$

0.84, and 0.90 for the depression, anxiety, and stress subscales, respectively, which indicates a good reliability. Sahebi, Salari, and Asghari (2005) developed Farsi version of DASS-21. Reliability of DASS-21 subscales was 0.77 for depression, 0.79 for anxiety, and 0.78 for stress. Cronbach α coefficients were 0.70 for the depression subscale and Beck Depression Inventory, 0.67 for anxiety subscale and Zang Anxiety inventory, and 0.49 for Stress subscale and Perceived Stress Inventory.

Data Analysis

Pearson correlation coefficient and regression analysis were used to analyze the data. SPSS version 18 was used for data analysis.

3. Results

Pearson correlation coefficients were calculated (Table 1) to examine the relationship among scrupulosity, OCD symptoms, obsessive beliefs, and thought-action fusion. According to Table 1, there was a significant correlation between scrupulosity total score and OCD total score ($r=0.275$, $P<0.05$), which means higher scores in scrupulosity are correlated with higher scores in OCD. In addition, there was a significant correlation between scrupulosity and obsessive beliefs total score ($r=0.558$, $P<0.01$), which means higher scores in scrupulosity are correlated with higher scores in obsessive beliefs. Also, there was a significant correlation between scrupulosity and thought-action fusion total score ($r=0.506$, $P<0.01$), which means higher scores in scrupulosity are correlated with higher scores in thought-action fusion.

To determine the share of obsessive-compulsive disorder, obsessive beliefs, and thought-action fusion in explaining the variance of scrupulosity, simultaneous stan-

dard regression analysis was used. The results are shown in Table 2.

The results showed a significant F for obsessive-compulsive disorder ($F=6.399$, $P<0.05$), which can explain the variability of the dependent variable at a confidence level of 95% ($\beta= 0.275$, $t= 2.530$). The adjusted R^2 showed that obsessive-compulsive disorder can explain 6% of the variability of scrupulosity. In addition, the F for obsessive beliefs was significant ($F= 35.266$, $P<0.001$), which can explain the variability of the dependent variable at a confidence level of 99.9% ($\beta= 0.558$, $t= 5.938$). The adjusted R^2 showed that obsessive-compulsive disorder can explain 30% of the variability of scrupulosity. Furthermore, the F for thought-action-fusion was significant ($F=26.887$, $P<0.001$) and can explain the variability of the dependent variable at a confidence level of 99.9% ($\beta= 0.506$, $t= 5.185$). The adjusted R^2 showed that obsessive-compulsive disorder can explain 24% of the variability of scrupulosity.

To determine the share of depression-anxiety-stress, obsessive-compulsive disorder, obsessive beliefs, and thought-action fusion in the variance of scrupulosity, hierarchical multiple regression analysis was used. The results are shown in Table 2.

The results show that depression-anxiety-stress total score significantly explained variability of scrupulosity ($\beta=0.398$, $t=3.371$, $P<0.0001$) when entered into the analysis at first step. However, when OCD total score was entered into the analysis after controlling for depression-anxiety-stress, the results were not significant ($\beta=0.108$, $t=0.894$, $P= NS$), indicating that the effect of OCD on scrupulosity depended on participants' general distress levels. Obsessive beliefs ($\beta=0.520$, $t=4.265$, $P<0.0001$) and thought-action fusion ($\beta=0.299$, $t=3.732$, $P<0.001$) significantly explained variability of scrupulosity, even af-

Table 2. Summary of the regression model, variance analysis, and statistical properties of regression of OCD total score, obsessive beliefs total score, thought-action fusion total score on scrupulosity.

Inserted variable	F	R ²	Adjusted R ²	SE	B	β	t
OCD Total score	6.399*	0.076	0.064	0.156	0.394	0.275	2.530*
Inserted variable	F	R ²	Adjusted R ²	SE	B	β	t
Obsessive beliefs total score	35.266***	0.311	0.303	0.038	0.223	0.558	5.938***
Inserted variable	F	R ²	Adjusted R ²	SE	B	β	t
Thought-action fusion Total score	26.887***	0.256	0.247	0.132	0.687	0.506	5.185***

*** $P<0.001$, ** $P<0.01$, * $P<0.05$

Table 2. Summary of the regression model, variance analysis, and statistical properties of regression of the depression-anxiety-stress, obsessive-compulsive disorder, obsessive beliefs, and thought-action fusion on scrupulosity.

Inserted variable	F	R ²	Adjusted R ²	SE	B	β	t
First step	***13.921	0.151	0.141				
Depression anxiety stress Total score				0.157	0.587	0.389	***3.371
Second step	7.343*	0.160	0.138				
Obsessive-compulsive Disorder total score				0.137	0.154	0.108	0.894
Third step	***17.588	0.560	0.296				
Obsessive beliefs total score				0.049	0.208	0.520	4.265***
Forth step	***15.198	0.612	0.350				
Thought-action fusion Total score				0.143	0.406	0.299	2.732**

***P<0.001, **P<0.01, * P<0.05

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ter controlling for shared contributions of general distress. In sum, the regression analysis shows that depression-anxiety-stress and obsessive beliefs are the most powerful variable to predict variability of scrupulosity.

To determine the share of subscales of each independent variable in explaining the variance of scrupulos-

ity, hierarchical multiple regression analysis was used. Anxiety, depression, and stress subscales as indicators of general distress and obsessive-compulsive disorder subscales that are significantly correlated with scrupulosity (neutralizing, washing, and obsessing), obsessive beliefs subscales (responsibility and overestimation of threat, perfectionism and intolerance of uncertainty, importance

Table 3. Summary of the stepwise regression model, variance analysis, and statistical properties of regression of the subscales of depression anxiety stress, obsessive-compulsive disorder, obsessive beliefs, and thought-action fusion on scrupulosity.

Inserted variable	F	R ²	Adjusted R ²	SE	B	β	t
First step	**5.272	0.172	0.140				
Anxiety				0.503	1.201	0.235	*2.389
Depression				0.506	0.479	0.140	0.948
Stress				0.695	-0.068	-0.014	-0.089
Second step	*3.518	0.224	0.161				
Obsessing				0.726	1.147	0.196	1.581
Washing				0.575	0.644	0.124	1.119
Neutralizing				0.623	0.408	0.074	0.654
Third step	***5.223	0.837	0.391				
Responsibility/ Threat				0.143	-0.238	-0.248	-1.659
Perfectionism/ Certainty				0.145	0.169	0.163	1.166
Importance of thoughts/ Controlling thoughts				0.173	0.600	0.526	**3.465
Moral thought-action fusion				0.235	0.299	0.152	1.272
Probability thought-action fusion for thers				0.551	0.728	0.196	1.322
Thought-action fusion for self				0.695	-0.464	-0.089	-0.668

***P<0.001, **P<0.01, * P<0.05

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Table 4. Results of the Independent t tests and descriptive statistics for depression-anxiety-stress, obsessive-compulsive disorder, scrupulosity, obsessive beliefs, and thought-action fusion by sampling phase.

Outcome	Group						95% CI for Mean Difference	P	t	df
	Phase 1 sampling			Phase 2 sampling						
	M	SD	n	M	SD	n				
Depression anxiety stress	33.20	11.321	30	27.96	11.879	50	-0.127, 10.607	0.056	1.944	87
OCD	29.33	15.550	30	27.76	10.407	50	-4.869, 8.015	0.625	0.492	44.768
Scrupulosity	45.27	14.113	30	27.76	10.407	50	13.839, 27.534	0.0001*	0.016	78
Obsessive beliefs	210.80	47.90	30	187.36	40.755	50	3.418, 43.461	0.22	2.331	78
Thought-action fusion	42.27	14.268	30	36.08	12.068	50	0.242, 12.131	0.42	2.072	78

Note: Satterthwaite approximation employed for OCD due to unequal group variances. * P < 0.05

of thoughts and control of thoughts) and thought-action fusion subscales (moral thought-actions fusion, probability thought-action fusion for others and probability thought-action fusion for self) as independent variables, and scrupulosity as dependent variable were entered into the regression analysis. The results are shown in Table 3.

The results showed that among depression, anxiety, and stress subscales, anxiety can significantly predict variability of scrupulosity ($\beta=0.325$, $t=0.389$, $P<0.05$). For each standard deviation of change in anxiety scores, scrupulosity scores will increase as much as 0.235 standard deviation. None of the OCD subscales can explain the variability of scrupulosity ($P=NS$). Among obsessive beliefs and thought-action fusion subscales, only ‘Importance of Thoughts and Controlling Thoughts’ can significantly predict variability of scrupulosity ($\beta=0.526$, $t=3.465$, $P<0.01$) and has the highest power among all variables entered into the equation. For each standard deviation of change in ‘Importance of Thoughts and Controlling Thoughts’ scores, scrupulosity scores will increase as much as 0.526 standard deviation.

In order to determine whether participants recruited from clinics (sampling phase 1) were different from participants recruited from internet social networks (sampling phase 2) regarding the main variables of the study, the Independent t test was used and the two groups were tested with respect to depression-anxiety-stress, obsessive-compulsive disorder, scrupulosity, obsessive beliefs, and thought-action fusion. The results are shown in Table 4.

Results of the two Independent samples t test showed that mean scrupulosity differed between participants of phase 1 sampling ($M=45.27$, $SD=14.113$, $n=30$) and participants of phase 2 sampling ($M=27.76$, $SD=10.407$,

$n=50$) at 0.05 level of significance ($t=0.016$, $df=178$, $P=0.0001$, 95% CI for mean difference, 13.839 to 27.534). Therefore, participants who were recruited from clinics scored higher with respect to the measure of scrupulosity than those recruited from internet social networks. The results also showed that there were no statistically significant differences, at 0.05 level of significance, between the two groups with respect to depression anxiety stress, obsessive-compulsive disorder, obsessive beliefs, and thought-action fusion. This means that two groups do not differ with respect to measures of depression-anxiety-stress, OCD, obsessive beliefs, and thought-action fusion.

4. Discussion

This study aimed to investigate the relationship between scrupulosity and obsessive-compulsive symptoms as well as OCD-related cognitive styles (obsessive beliefs and thought-action fusion). The results showed a significant relationship between scrupulosity and obsessive-compulsive symptoms. This is in accord with findings of Nelson et al. (2006), Abramowitz et al. (2002), Witzig (2005), Warshowsky (2006), Olatunji et al. (2007), and Inozu et al. (2012), who showed that OCD and scrupulosity total scores changed in the same directions. It is reasonable to expect that scrupulosity, as an OCD subtype, is significantly correlated with OCD symptoms. This significant relationship shows that scrupulosity is more than normative, culture-bound beliefs and behaviors observed in non-clinical populations; rather it is closely related to OCD pathology. The pathology of scrupulosity is also underlined by the significant relationship between scrupulosity and depression-anxiety-stress total score. However, depression-anxiety-stress had a stronger correlation with scrupulosity than with OCD, which is in contrast with previous research findings (Nelson et al., 2006; Inozu et al., 2012) noting that scrupulosity was more linked to OCD than anxiety and depression. This could be due to differ-

ent instruments and samples that were used. Both Nelson et al. (2006) and Inozu et al. (2012) used Beck Depression Inventory and Beck Anxiety Inventory for their research. This scale gives a total score for depression, anxiety, and stress, which could have more power on scrupulosity compared to anxiety and depression as separate entities. Inozu et al. (2012) showed that in their Muslim sample, depression and anxiety had more predictive power on scrupulosity compared to OCD, which is consistent with present findings. It is possible that scrupulosity is more depression and anxiety provoking in Muslims than in Christians, lending support to the stronger link between scrupulosity and global distress in this population. Future research should investigate the link between depression/anxiety and scrupulosity versus OCD in Muslims.

The results showed a significant relationship between scrupulosity and obsessing subscale of OCI-R, which means that individuals with high scrupulosity experience more mental obsessions. This is in accord with the findings of Nelson et al. (2006), Warshowsky (2006), Olatunji et al. (2007), and Inozu et al. (2012). Abramowitz et al. (2002) and Warshowsky (2006) also noted a relationship between scrupulosity and obsessive doubt, a kind of mental obsession. In this regard, factor analytical studies have yielded interesting results. Witzig (2005), for instance, demonstrated that Penn Inventory of Scrupulosity loaded on an 'obsessing factor,' which suggests the obsessing feature of scrupulosity. Also, McKay et al. (2004), Tek and Ulug (2001), Baer (1994), Mataix-Coles et al. (1999), and Dunne (2000) showed that sexual, aggressive, and religious OCD were loaded on a factor commonly referred to as 'pure obsessions' or 'primary obsessions.' This issue is important because this factor lacks a 'compulsive' component, similar to the case with sexual and aggressive obsessions. This shows that scrupulosity is obsessive-based and not associated with compulsive act.

Clinical observations in Iran indicate that patients with scrupulosity often suffer from continuous doubts about accuracy of their prayers and try to achieve an ideal perfection of religious acts in self-defeating manners. Frequent refer to clergymen and studying theological treatises are examples of the efforts to decrease religious doubts. These attempts are usually fruitless and give way to new obsessive doubts. This explains the observed significant association between scrupulosity and mental obsession.

According to the results, there was a significant relationship between scrupulosity and washing subscale of OCI-R. This association has not been reported by studies of Muslim samples so far. However, religious-washing OCD (known as Nejasat OCD) is the most prevalent

subtype of OCD in Iran (Fata, 1998; Dadfar et al., 2001) and obsessive thoughts about Nejasat and compulsive acts of Taharat are the main symptoms of scrupulosity in Iran (According to Islam, Nejasat is the source of impurity, which includes blood, urine, faeces, and discharges of sexual organs. Nejasat should be removed by the act of Taharat, which is a religious washing ritual). This can explain the observed association between scrupulosity and washing OCD. Nevertheless, this relationship was not as strong as the relationship between scrupulosity and mental obsession. This might be due to the obsessive nature of scrupulosity, which has been shown in studies of Christian samples. Another reason, however, could be that Penn Inventory of Scrupulosity (PIOS) is not sensitive enough for measuring this construct in Muslims, as also suggested by Greenberg and Huppert (2010). In the present study, obsessive OCD had a strong relationship with 'Fear of Sin' subscale of PIOS and not with 'Fear of God' subscale. On the other hand, washing was strongly related to 'Fear of God' and not to 'Fear of Sin.' This shows that Muslim scrupulosity might have compulsive, washing-related components that do not represent sin but rather associated with fear of God and punishment, overlooked by PIOS. Thus, a thorough examination of Muslim scrupulosity components and accordingly developing a more sensitive instrument is warranted.

The results showed a significant association between scrupulosity and obsessive beliefs. This is in agreement with the findings of Nelson et al. (2006), Witzig (2005), Gonsalvez et al. (2010), and Inozu et al. (2012) who demonstrated the same relationship between scrupulosity and obsessive beliefs. Regression analysis demonstrated that the 'Importance of Thoughts and Controlling Thoughts' subscale could significantly predict the variability of scrupulosity. This can be explained by the previously mentioned Salkovskis's cognitive-behavioral theory (1985) and Rachman's cognitive theory (1997,1998,2003), which put an emphasis on the role of the religious belief 'sin by thought' in etiology and maintenance of OCD. Since 'sin by thought' is not a Muslim religious belief, the arising question is that what causes 'Importance of Thoughts and Controlling Thoughts' to be significantly related to scrupulosity. On one hand, 'Importance of Thoughts and Controlling Thoughts' plays a major role in etiology of mental obsession (Obsessive-Compulsive Cognitions Working Group, 2003, 2005). As scrupulosity is strongly related to mental obsession, it would show a strong association with 'Importance of Thoughts and Controlling Thoughts.' On the other hand, some studies (Sica et al., 2002; investigating a Christian sample; Yurulmaz et al., 2009; investigating Muslim and Christian samples) showed a strong association between religiosity

and obsessive beliefs (including 'Importance of Thoughts and Controlling Thoughts'). These findings can possibly justify the relationship between 'Importance of Thoughts and Controlling Thoughts' and scrupulosity in Muslim populations. Since the relationship between scrupulosity and obsession has rarely been investigated in Muslim populations in general, and in Iranian Muslims in particular, more researches need to be carried out to support the role of 'Importance of Thoughts and Controlling Thoughts' in etiology and maintenance of Muslim scrupulosity.

The results showed a significant relationship between scrupulosity and thought-action fusion. This is in accord with findings of Rassin and Koster, (2003), Nelson et al. (2006), and Warshowsky (2006), who reported the same associations between scrupulosity and thought-action fusion in Christian samples. According to their results, there was also a strong relationship between scrupulosity and moral thought-action fusion. As mentioned before, Sakovskis (1985) and Rachman (1997, 1998, 2003) discussed the role of moral thought-action fusion (or 'sin by thought') in etiology and maintenance of OCD. Some investigators believe that the relationship between religiosity and thought-action fusion exist in Jewish and Muslim people, but is not as strong as that in Christian people. For instance, Cohen and Rozin (2001) and Siev et al. (2010) showed that Christians scored higher than Jews on moral-TAF scale, but the relationship between religiosity and scrupulosity in Jews was significant. The relationship among thought-action fusion, religiosity and scrupulosity has not been studied in Muslim people. In fact, the present research is the first attempt to investigate the association between scrupulosity and thought-action fusion in Muslims. Thus, this relationship and the link between thought-action fusion and religiosity in Muslim people, especially Iranian Muslims, need to be investigated further.

The results showed that 'moral-TAF' had a stronger association with 'Fear of Sin' and 'Fear of God' than 'probability-TAF' had. Evidently, moral-TAF items are very similar to 'Importance of Thoughts and Controlling Thoughts' items. This might be due to the fact that moral-TAF items are focused in the importance of sinful thoughts and the need to control them, and are better suited for measuring obsessive and ethical dimensions of scrupulosity compared to compulsive acts of scrupulosity. As mentioned previously, a thorough examination of Muslim scrupulosity components and accordingly developing a more sensitive instrument is warranted.

The point worth noticing was the association between scrupulosity and probability-TAF, which was shown to be significant for both subscales, probability-TAF for self

and probability-TAF for others. This is consistent with the findings of Warshowsky (2006). Some studies showed a relationship between scrupulosity and magical thinking (Tolin, Abramowitz, Kozak, and Foa, 2001; Olatunji et al., 2005, Rassin and Koster, 2003; Joseph and Diduca, 2001). On the other hand, a significant association between probability-TAF and magical thinking has been demonstrated (Lee, Cogle, and Telch, 2005; Warshowsky, 2006). Thus, the relation between scrupulosity and 'probability-TAF' can possibly be moderated by a third variable, which is magical thinking. This conclusion has not been empirically tested and needs to be investigated further using Muslim samples.

The relationship between scrupulosity and 'probability-TAF' can also be explained by other perspectives. The items of 'probability-TAF' for self and others in TAF scale point to such negative events as car accidents and illnesses, which can happen by thinking. This is very similar to the superstitious folk belief that a person can have an 'evil eye,' making negative events occur for self and others by thinking about those events (even unintentionally). In this regard, 'evil eye' can be regarded as a kind of probability thought-action fusion, which plays a role in the development and maintenance of scrupulosity. That is, when people experience intrusive thoughts about and urge for hurting themselves or others, they might assume that those thoughts would occur due to their 'evil eye'. As a result, they would suppress those thoughts and urge or use various ways to neutralize them. Since hurting others is unethical, it might be very disturbing for people with very high moral standards to have an 'evil eye' on others. This explains the strong association between scrupulosity and 'probability-TAF for others' in the present study.

The present study has certain implications for further research. The investigation of the interactional role of religion-related factors (for instance, religiosity, religious commitment, religious beliefs, magical thinking, and superstitious beliefs) with scrupulosity, OCD symptoms, and OCD cognitions would increase our understanding of the interactions between religion and cognitive phenomena on one hand, and between religion and OCD symptoms on the other hand. In an exceptional study, Witzig (2005) demonstrated that those Christians with higher scores on scrupulosity had lower levels of religious commitment and spiritual well-being. Nevertheless the mutual effect of religion/spirituality factors and scrupulosity is not clear. For instance, it is not known whether a low religious commitment would result in scrupulosity or vice versa. In addition, the relationship between religion/spirituality factors and scrupulosity in Muslims might be different from Christians (because of variability of cultural-religious as-

sumptions about religion and spirituality). This needs to be further investigated in studies on Iranian Muslims.

In Iran, Naziri, Dadfar, and Karimi-Kimsa (2005) showed that dysfunctional religious beliefs had a distinctive role in OCD symptom severity. In fact, dysfunctional religious beliefs about washing and Taharat could explain variability of OCD severity better than cognitive dysfunctional beliefs (Naziri et al., 2005). Naziri and colleagues defined dysfunctional religious beliefs as overvalued ideation and magical thinking; however, they did not specify these beliefs. In this regard, it is useful to examine dysfunctional religious beliefs and magical thinking specific to Iranian culture, which may play a role in etiology of scrupulosity. Another implication for research would be to validate PIOS and TAF scale to be used in further OCD research with Iranian samples. And finally, it is essential to make phenomenological investigations with regard to different dimensions and symptoms of scrupulosity in Iran and to develop measures, which are sensitive enough to be used with this population.

The present study has clinical implications for psychotherapy too. Effective therapeutic techniques for scrupulosity should concentrate more on the emphasis that scrupulous individuals put on their immoral, blasphemous thoughts and their control strategies. Scrupulous persons need to be educated to differentiate between sinful thoughts and normal cognitive intrusions, and to learn about how thought suppression could result in mental obsessions. They also need to be taught not to hold themselves overly responsible for their every act, and to make a distinction between control strategies and healthful religious acts. This psychoeducation would render religious obsessions and compulsions ego-dystonic and prepare scrupulous individuals for behavioral exposure. Without this initial education, they would regard exposure as an insult to their religion and resist it. For those with pathological religious doubts, it is crucial to learn tolerating uncertainty and not to resort to assurance seeking behaviors. Abramowitz and Jacoby (2014) have discussed different therapeutic strategies for scrupulosity.

Regarding the limitations of the study, unavailability of the standardized Persian versions of TAF and PIOS, small sample size, and limitations of sampling and data collection might have reduced generalizability of the results. Since participants were recruited at different time periods from different populations, the sample was not homogenous. Generally, psychopathological studies of internet samples are evaluated with caution, because of the possibility of deception and faked symptoms. A recent study (Moritz, Van Quaquebeke, Hauschildt, Jelinek and Gön-

ner, 2012), however, showed that OCI-R can discriminate between fake and authentic responses, in other words, non-patients who faked symptoms scoring significantly higher than OCD participants of comparable studies. Another study (Wootton, Titov, Dear, Spence, and Kemp, 2011) demonstrated that internet participants with a probable diagnosis of OCD scored the same as OCD patients, but higher than non-patients, with respect to the measure of symptom severity. For this study, we employed two methods to control the effects of the internet recruitment. Firstly, we used the OCI-R cut-off points recommended by Foa et al. (2002) for differentiating between OCD and anxious participants, assuming that the internet sample might have had anxiety/worry symptoms. And secondly, we compared two samples and showed that they did not differ with respect to main variables of the study, except for scrupulosity. Nevertheless, score ranges for OCI-R were restricted due to screening, which might reduce the power of correlations. Thus, this study needs to be replicated using homogenous samples, as well as standardized questionnaires.

In sum, this study investigated how scrupulosity is related to OCD symptoms and OCD-related cognitive styles in an Iranian Muslim sample with OCD. The results showed that scrupulosity was related to OCD symptoms, in particular, obsessive type. Scrupulosity was also associated with different OCD-related cognitive styles, especially 'Importance of Thoughts and Controlling Thoughts,' as well as moral and probability Thought-action Fusion. The results were in accord with findings of comparable studies on Christian samples.

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